ARCHIVES OF OPHTHALMOLOGY.

EXPERIMENTS ON THE CULTIVATION OF SO-CALLED TRACHOMA BODIES

BY H. NOGUCHI AND MARTIN COHEN, NEW YORK.

(With 18 illustrations on Text-Plate No. III.)

VON PROWAZEK and Halberstaedter, in 1907, described certain cell inclusions in the conjunctival epithelium in trachoma, consisting of coarse coccoid and numerous minute granular bodies, the former staining bluish and the latter reddish in Giemsa solution. Introduction of scrapings into the eye of orang-outangs produced in a few days similar inclusions accompanied by a mild form of conjunctivitis, both of which disappeared together. After these bodies had been generally accepted as the etiological cause of trachoma, the same investigators detected similar inclusions in uncomplicated blennorrhea neonatorum which gave rise to a discussion as to the specificity of the trachoma bodies. Herzog's theory was that the gonococcus underwent transformation into small forms which, when accumulated, assumed the appearance of trachoma bodies. Williams regarded the inclusions as degenerate forms of the Koch–Weeks bacillus. Others considered them to be of parasitic origin or products of degeneration due to a still undetected agent. The present authors, on the other hand, have come to view these bodies as a definite pathogenic organism, holding that its occasional occurrence in gonorrheal conjunctivitis was an accidental coincidence which could not be explained by the transformation of the gonococcus into trachoma bodies; nor could the two etiological factors operate to produce trachoma. They arrived at this conclusion when they succeeded in cultivating the organism outside the body,

thereby proving that it was actually living. In the preliminary report which forms the subject of their paper (*Journal of Experimental Medicine*, vol. xviii., No. 5, 1913), Cohen has contributed the clinical part, and Noguchi the bacteriological one. The material selected consisted of (1) conjunctivitis with trachoma bodies inclusions; (2) typical trachoma without trachoma bodies; (3) acute catarrhal conjunctivitis with neither trachoma nor cell inclusion affections. Scrapings of the conjunctiva were collected and mixed in a tube holding ascitic fluid under aseptic precautions. The usual culture methods proving negative, the procedure for cultivating spirochetæ was adopted. A piece of rabbit kidney and about 10*cc* of ascitic fluid were placed in a tube, to which the conjunctival scrapings or a piece of tissue were added. After the inoculation a layer of about 3*cm* paraffin oil was added, and the tube kept in an anaërobic jar at 37° C. for about ten days. Films made from each were air-dried and fixed in methyl-alcohol for thirty minutes and Giemsa-stained for an hour. In this way many minute coccoids were isolated, mostly in pairs, which could be readily distinguished by their small size and reddish stain from the host of ordinary bacteria which were also present. The medium best suited consisted, so far, of two parts of slightly alkaline beef infusion agar and one part of ascitic fluid with 0.05 % of glucose. To obtain a pure growth, a single colony was transferred to a new tube containing a piece of sterile kidney and ascitic fluid which, after the addition of paraffin oil, was kept at 37° C., the anaërobic apparatus being now omitted. Transfers into other media, without fresh tissue, proved negative. For some generations, the organisms failed to grow, but after three or four days there was a slight turbidity. Films made from the bottom of the tube and stains made with Giemsa solution revealed the organism, usually in two main and many intermediate forms. These are illustrated in a series of eighteen microphotographs. The coarse forms stain blue, the finer ones red; they usually mingle, but may also occur separately. It was seen by careful study that the different morphological elements are not due to contamination with each other, and a comparison between the cultivated organism and the cell inclusions in corresponding stages shows a striking similarity.

No odor is produced in any medium. The organism thus isolated is Gram amphiol and loses its stain when decolorized long enough. It stains with carbolized fuchsin or gentian violet, also faintly with Loeffler's methylene-blue. The variations in form also occur in trachoma, blennorrhea neonatorum, and inclusion conjunctivitis.

The organism was isolated from conjunctivitis with inclusions of the trachoma bodies and trachoma cases without inclusions. This organism was not found in other forms of conjunctivitis without inclusions. It presents the characteristic morphological features of trachoma bodies, which undergo various transformations at different stages of culture. Inoculation of monkeys proved negative, while in other suitable animals the inclusions could be produced by direct inoculation of human trachoma without cell inclusions. Hence the possibility of the organism being present in such cases of trachoma, although not in the form of cell inclusions. Trachoma bodies and gonococcus infection are therefore totally distinct, but whether the former and the isolated organism are identical can not yet be positively stated. This point is now awaiting further elucidation.

EXPLANATION OF PLATE III

All the figures are from film preparations stained with Giemsa solution. Magnification × 1000.

FIG. 1. Initial stage of the so-called trachoma bodies in a conjunctival epithelium from a case of trachoma.

FIG. 2. Similar inclusion from a case of so-called inclusion conjunctivitis.

FIGS. 3, 4, and 5. Initial stage of the cultivated organism, forty-eight hours old in ascitic fluid tissue media.

FIGS. 6 and 7. Intermediary stages of the trachoma bodies from a case of trachoma.

FIG. 8. Intermediary stage of similar inclusion from a case of so-called inclusion conjunctivitis.

FIGS. 9 and 10. Intermediary stage of the cultivated organism, three to four days old in ascitic fluid tissue media.

FIGS. 11 and 12. Inclusions consisting of intermediary and elementary forms of the trachoma bodies, from a case of trachoma and one of inclusion conjunctivitis.

FIGS. 13 and 14. The cultivated organism showing stages where intermediary and elementary forms are mingled, four to five days in ascitic fluid tissue media.

FIGS. 15 and 16. Inclusions consisting exclusively of minute (elementary) granules from similar cases.

FIGS. 17 and 18. The cultivated organism which entered the stage corresponding to the elementary granules of the inclusions, seven days in ascitic fluid tissue media.

SOME RESULTS AFTER TREPHINING.[1]

By Dr. ARNOLD KNAPP, New York.

OF twenty operations of trephining for glaucoma performed during the past winter, some of the cases have given results which were unusual and instructive, and helped to formulate an opinion on the value of this operation which is now universally on trial.

The method of operation followed the principles laid down by Elliot: a broad conjunctival flap, splitting of the cornea with a broad-bellied miniature scalpel, and a *2mm* trephine. This size was found necessary after experience with soft eyes and where the aqueous escaped prematurely. If the trephine opening is too small, it was found difficult to cleanly divide the attachment of the scleral disk; and through this small opening it was very difficult to fish out the iris. It was soon observed that the buttonhole iridectomy must be large to insure filtration. In one case, S. Y., where the iris did not prolapse with the scleral disk, it was not possible to seize it without subjecting the eye to too much damage, and nothing was done. Two days later the tension had returned and underneath the conjunctival flap a small hernia of iris tissue could be distinctly observed. The flap was again reflected and the protruding iris cut away. This was followed by a satisfactory reduction in tension. In the other case, where only an incision was made into the prolapsed iris, about three weeks later the tension was again raised. The conjunctival flap was thickened and hard, so at another operation this thickened flap was reflected and was found to consist of very firm tissue, and the iris wound

[1] Presented with patients at meeting of Section on Ophthalmology, N. Y. Acad. Med., November, 1913.

was united and adherent to the subconjunctival, hard, scar tissue. An iris opening was made and the flap thinned. This has satisfactorily reduced the tension.

The reduction in tension was associated with the formation of a cystoid cicatrix, except in the following case:

> R., operated on January 18, 1913. The usual operation with a *2mm* trephine was performed. The conjunctival flap became flattened and to-day it is perfectly flat. An opening in the sclera can be distinctly seen through it and there is a distinct peripheric buttonhole to be seen in the iris. Tension to-day 18. No miotics have been used.

A case of interest is one of a patient who had an acute congestive attack in the course of chronic glaucoma in her only eye. A trephining was performed one year ago with buttonholing the iris. Vitreous prolapsed. This was cut away and still more appeared. The flap was then replaced and sutured. The healing occurred without complication and to-day there is directly over the scleral opening a clear cystic swelling. The tension has almost remained normal since the operation and to-day is 14, and the sight has been preserved.

Detachment of the *chorioid* occurred in three cases. These were cases of chronic glaucoma, in which the tension was 70. The detachment was not observed until the day of the first revisit to the hospital after their discharge. In one case (Bodner), a bilateral detachment of the chorioid could be easily seen both by oblique and direct illumination, the detachment coming together in the center, so that the defect in the field presented a typical hour-glass contraction. In the other two cases detachment occurred only on one side. The tension, of course, was extremely reduced. The detachment was recovered from in one case after two weeks; in the other two cases the condition remained for from six to eight weeks. This prolonged hypo-tension resulted in the formation of a great many iritic adhesions. These cases to-day, about a year after the trephining, have a tension of 10, 5, and 6 respectively. There are no signs of any detachment of the chorioid and the vision has not deteriorated. At the same time the extreme softness of two of the eyes is alarming.

Two cases presented the complication of a *late infection.*

In one (Neckritz), an iridectomy had been done upwards for chronic glaucoma, which did not succeed in permanently reducing the tension. A trephining was performed in the lower margin of the cornea. The resulting cicatrix was satisfactory and the tension has been kept down. The lower lid, however, did not cover completely the small swelling, and the patient appeared one day with a very severe inflammation of the eye. The process was fortunately arrested and no ill-effect followed, though it seemed to me that the infection must have taken place at the site of the thinned conjunctival flap.

The other case was one of a cystoid scar, following a Lagrange operation performed two years ago. The patient, about a year after the first operation, struck her eye against a gas fixture, and when she came to the hospital had a very intense inflammation of the eye with the symptoms of purulent iritis. This, fortunately, also was relieved by treatment and her sight was preserved, though the result of this infection was the obliteration of the cystoid scar, and the eye again became hard. A trephining was then done, and this has had a satisfactory effect in preserving normal tension.

In one patient the operation of trephining was followed with a great deal of reaction, especially a severe *iritis*. It did not seem to me that this was due to infection. It was a very stout patient, who was operated upon for chronic glaucoma by trephining. The operation was immediately followed by marked chemosis of the conjunctiva and iritis. No anterior chamber and no bulging of the conjunctiva resulted. The tension remained high, at 31, though the hole in the sclera was distinctly visible. There are cases which, even after an iridectomy, seem to show a recrudescence of inflammatory conditions; and it is, of course, impossible to say whether the mere performance of a trephining should be regarded as the cause for this.

If we look over these conditions that have occurred after trephining operations, we find that the complications may be regarded as three, namely: iritis, hypotony, and late-infection. The tendency to iritis is unquestionably pronounced, as must be the experience of any one who is performing this operation; and even the early use of atropin does not prevent the proliferation of some uveal pigment and consecutive deposit on the

lens capsule. We are in the habit of bringing atropin ointment into the conjunctival sac at the close of the operation. The complication of hypotony is a very serious one. We can not at the present day state what the outcome of an eye is whose tension is reduced to 5 or 6. It surely must be a pathological condition. The danger of late infection is a particularly real one. Considerable attention has been drawn to this in recent literature. There can be no question that an eye with a cystoid cicatrix is not a sound eye, nor an eye enjoying the benefit of a normal protecting membrane. The sight of a large cystoid cicatrix which we have repeatedly observed measuring 4 or 3*mm* is surely one to cause some anxiety. On the other hand, the advantages of a trephining operation seem to me to consist in that the operation is a safer one in hard eyes than any other operation that has been suggested for reducing the tension. There is less likelihood of any complication arising. In this connection I would like to draw attention to a complication which we have observed after Lagrange operations, which consisted in a peculiar form of cataract which sometimes developed after the operation. This opacity in the lens seemed to be rather a wrinkling of the posterior capsule. It can be explained as due to inordinate pressure exerted upon the suspensory ligament in completing the oblique scleral incision. The other advantage of the trephining operation, to my mind, is that it is the most certain way of obtaining a cystoid cicatrix. I think that notwithstanding apparent advantages of trephining in certain forms of glaucoma, in consideration of the dangers of the complications, we have no reason to abandon iridectomy in cases of acute glaucoma or in cases of early glaucoma where prodromal attacks have been the only symptoms. I would therefore place as the only indication for a trephining operation cases of chronic glaucoma or cases seen in the congestive attacks during the course of a chronic glaucoma.

Our aim, I think, will be to find means of graduating the degree of fistulization, to more definitely find the site where an opening will remain permanent, and the smallest trephine opening which will keep down the tension. At the same time, should we not advance further in the treatment of glaucoma by paying more attention to the earliest signs? This we can do by the use of the tonometer, and then possibly the process can

be arrested by performing a peripheric iridectomy before organized obliteration of the iris angle occurs. Many of our cases need not develop into chronic cases. This holds good particularly in cases where one eye has been operated upon for glaucoma. Should not the other, apparently healthy, eye then be operated upon? For it is practically a certainty that glaucoma will, sooner or later, develop in this eye. This, I was pleased to see, was Colonel Elliot's practice in India.

ANGIOMA OF THE LIDS AND BROW.

By H. B. LEMERE, M.D., Omaha, Neb.

(With four photographs on Text-Plate No. IV.)

I REPORT the following case on account of the remarkable effect of the measures used for its relief.

The patient, Edward Hansohn, age five months, Kiron, Iowa, was presented for treatment on October 29, 1912. The parents stated that at birth there was a small purplish tumor, the size of the nail of their little finger, on the nasal extremity of the lower lid of the left eye. This rapidly extended for three months when it was almost as large as it was at the time of presentation. The tumor covered the whole upper lid and extended about one inch above the brow. It was elevated and was port-wine color. The thickness and distention of the upper lid by the angiomatous mass were so great that it overhung the lower lid, and the globe could not be seen unless the tumor was pulled away with a lid elevator. Treatment was commenced by injections of boiling water. As the tumor was so large it was considered desirable to inject twice a day. The reaction from the hot water was fairly severe, and the afternoon injection was made with alcohol which produced less reaction. The usual injection was 30 minims of water as near to the boiling point as possible, or 30 minims of absolute alcohol. The amount injected was doubled when the reaction produced by the previous injection was not too great. The injections were all made as superficially as possible. I consider that the injections at the surface are less conducive to the danger of an organized thrombus being thrown into the circulation and producing an embolus. If the clot formed deeper, the return circulation would be greater in volume, and the danger of embolus being carried into the circulation would therefore be greater. These injections were continued twice daily for one week. The injections were then made once daily for three weeks,

ILLUSTRATING DR. LEMERE'S ARTICLE ON "ANGIOMA OF THE LIDS AND BROW."

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

and the patient was then sent home to remain a month. The second picture was taken on his return, which was two months after treatment had been commenced. As alcohol was much more easily controlled than hot water, absolute alcohol was used for all further injections, from 20 to 40 minims being injected each time: in January five injections were made, in February four, in April when the third picture was taken one injection, in May one injection, in July one injection, and on November 26, 1913, the last picture was taken. There was no discoloration of the lid or brow; the eye would open wide and the orbicularis had perfect motion; the globe was normal; the cilia of the brow were present, though not so thick as on the other side; there remained only a slightly depressed area with the skin a little harder than the opposite side, to mark the site where the tumor had formerly been. The injections were given without any anesthetic and the pain could only have been temporary, as the child often quieted within a minute after an injection.

Gifford[1] reports a case of angioma of the conjunctiva treated by injections of absolute alcohol. Most of the textbooks advise electrolysis or excision. The results in this case were certainly superior to those by electrolysis, and excision would have meant danger, both to life and to the eye, from contraction of lid and exposure of the orbit. The size of the tumor necessitated a larger quantity injected (30 to 60 minims) than reported in Gifford's case.

[1] H. Gifford, *Ophthalmic Record*, December, 1906.

NEW COMBINATION TRIAL LENSES, FOR THE REFRACTION OF CATARACT CASES.

By DAVID N. DENNIS, M.D., Erie, Penna.

TO have perfect or near perfect vision in cataract cases, it is necessary not only to have a perfect operation with free pupil, but also a thorough correction of the resulting aphakia and astigmatism. This latter varies in amount from 1 to 7 dioptres.

So many cataract cases are men and women still able and anxious to do close work, it would seem desirable to have a more exact way of refracting.

After working out the refraction with the ordinary trial case, one is apt to be disappointed in finding that the finished lens prescribed does not give the clear perfect vision which was obtained with the trial lenses. This is brought about by the distance of the spherical lenses from the cornea; whether the trial lenses are plano-convex or bi-convex; whether the cylinder is placed in front of or behind the spherical, in the trial frame; and whether the patient looks straight through the combination.

Examination of my records shows that the corneal astigmatism, as read by the ophthalmometer, and brought out by refraction a month after the operation, varies from 1 to 7 dioptres. After the expiration of six months to a year, the astigmatism drops, in about seventy-five per cent. of all cases, to from 1.50 to 2.50 dioptres.

The feasibility of grinding sphericals and cylinders in one trial lens was mentioned to Mr. William Wall, of Wall & Ochs, Philadelphia. He found the plan entirely practical. It was suggested that sphericals ranging from + 8.00 to + 16.00 be combined with cylinders from + 1.00 to + 4.00. Records

show that these combinations practically cover all of the lenses prescribed for these conditions.

By holding a plus or minus cylinder or spherical in front of these lenses, many additional combinations can be obtained. By having the combinations suggested, it will be possible to determine at once the exact vision.

Mr. Wall suggests that one or two trial cases of this kind be kept by manufacturing opticians, who can send them out to the oculists when they have appointments for refractions of this kind.

ON THE OPERATIVE TREATMENT OF SQUINT.

By Dr. E. LANDOLT, of Paris.

Translated from *Arch. f. Augenh'lk.*, Vol. LXXII., 1913.

(*With three figures in the text.*)

IT is an unusual fact that vertical squint is much less frequently observed than the squint in the horizontal plane, and never reaches the same degree.

While convergent and divergent strabismus are often 45°, a vertical divergence of 20° is a maximum which is rarely exceeded. Moreover, similar operations performed on the vertical muscles have a decidedly less influence upon the relative position and movement of the eyes than the operations performed on the horizontal muscles.

No true clinician attempts to determine the effect of a muscular operation with mathematical accuracy, for, in addition to variations in the insertion and degree of shortening of a muscle, the action on the eyeball must be considered from still a number of standpoints. It is, therefore, not possible to say that the tenotomy, or the advancement or the shortening of a muscle, causes a change in the direction of the eye of so and so many degrees, nor does the degree of the deviation of the eye necessarily give the degree of resection or advancement of the muscle which is necessary for correction.

Thus I am inclined to believe that the tenotomy of a superior rectus changes the position of the eye only for a few degrees up to five. When I speak of a tenotomy, I wish to state that I always perform this operation with great caution, subconjunctivally cutting the conjunctiva parallel to the margin of the muscle, and simply detach the tendon from the eyeball without loosening the adhesions of the muscle to the surround-

ing tissues. Though I am reluctant to perform this operation upon the internal or external rectus muscle, I am inclined to advocate it in the case of the superior rectus, because the restriction in motility which results from the tenotomy and which I have proven to equal a paralysis, will show itself only on raising the eyes—in other words, in a part of the field which is only rarely made use of. The interference with the motility of the eye after a moderate tenotomy of the superior rectus is not marked and can easily be corrected by raising the head.

I therefore advocate a tenotomy of the superior rectus in vertical deviations up to 5°. The operation is performed on the eye which is most raised. I would never undertake it on the inferior rectus of the other eye. For even if the vertical divergence be corrected in the primary position, the injurious effect of a tenotomy—namely, the paralysis—would show itself in the depression of the visual axis in the most important part of the visual field.

The most frequent and pronounced vertical differences of the eyes are caused by the paralysis of an elevator or of a depressor. In these cases, logically, we should perform an advancement with possibly a shortening of the paralyzed muscle. The advancement of an oblique muscle is associated with so much difficulty that it has hardly ever been performed with success. On the other hand, the advancement of that rectus muscle which is functionally associated with the paralyzed oblique, gives us such good results that the advancement of an oblique need not be undertaken.

I should like to report upon a few cases, particularly concerning the immediate effect to be obtained at the operation.

The first case was a man with two healthy eyes suffering from a paresis of the right superior rectus. The eye was directed downward 10°, outward 5°, and was rotated toward the temple. The advancement of the weakened muscle with a decided over-correction gave complete and permanent healing.

We are able to represent graphically the influence of the operation upon the position of the eyes.

In the adjoining scheme H H represents the horizontal plane. The black vertical line which crosses the horizontal line at zero is the healthy eye. The other line is the affected eye. Of the roman figures, I gives the position of the affected

eye before the operation, II its position shortly after the operation, III the normal position obtained by the operation. The points stand for the degrees expressed in arabic numbers. S denotes the left, D the right eye.

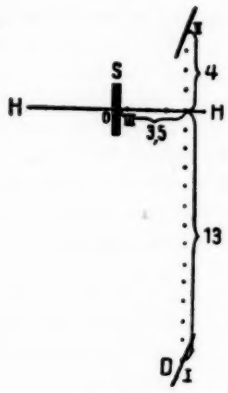

FIG. 1

Figure 1 shows us a case of paralysis of the superior rectus of the right eye, with a position 13° below the horizontal, with 3° of divergence and temporal rotation. The eye could be raised only 15° above the horizontal plane. I resected the weakened superior rectus and advanced it to the margin of the cornea. Five days after operation the eye stood 4° higher than the other normal eye (Fig. 1, II).

A month later there was complete fusion of both eyes (Fig. 1, III).

The eye could be elevated 55° above horizontal and thus gained 40°. The operation was done twelve years ago.

Among my cases of the paralysis of the superior oblique, I would like to report a case of traumatic origin. Following an operation of frontal sinus the patient suffered with a paralysis of the superior oblique of the left eye. The eye was deviated 12° upward and could be lowered only 38°. I advanced the inferior rectus to such a degree that eleven days after the operation the eye was placed 8° below the normal eye. After fifteen days the over-correction was only 2°. On the eighteenth day there was complete fusion. This has persisted throughout the entire field of vision for ten years.

Another case of paresis of the superior oblique was that of the left eye of a young man who, since early youth, has suffered from no known cause from paralysis of the left superior oblique. The left eye was deviated 12° upward, 6° inward, and rotated to the temple (Fig. 2, I). I resected the inferior rectus of this eye for about 3*mm* and advanced it to the margin of the cornea. Directly after the operation the position of the eye was 5° lower. Adduction and rotation of the eye were the same (Fig. 2, II). The over-correction gradually grew less. After

six weeks it had disappeared (Fig. 2, III). Fusion was complete in primary position and natural in the entire lower half of the binocular visual field. In looking to the right, where the influence of the oblique paralysis was still felt, the eye stood somewhat higher. On looking to the left, it was somewhat lower on account of the effect of the advanced inferior rectus muscle. The operation was done a number of months ago, and, judging from similar cases, I do not doubt but that the motility of both eyes will be a perfectly satisfactory one.

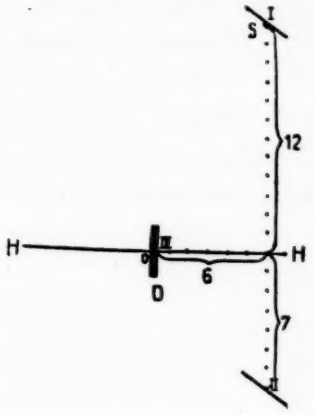

FIG. 2.

Another interesting case is the following:

A man, 32 years of age, visited my clinic in 1899 with a paresis of both internal and left external rectus muscles. The field of fixation of the left eye extended 10° inward and 22° outward. The field of the right eye was 15° inward and 60° outward. I advanced both internal recti with a decided resection. The result was so favorable that the patient was able to perform all his work binocularly. Thirteen years later, February of this year, he returned with a paralysis of the inferior rectus of the left eye. The left eye was situated 12° higher than the right, and diverged 6° with a nasal rotation (Fig. 3, I).

If in this case the vertical differences in the eyes are corrected with a prism, the divergence disappears and the facultative convergence seems perfectly normal. I shortened the paralyzed inferior rectus for 4*mm* and advanced it to the corneal margin. Directly after this the left eye was 16° lower than the other normally placed eye (Fig. 3, II).

The operation had an immediate effect of 12 + 16 = 28°. Divergence unchanged.

After a number of weeks an over-correction had disappeared and there was complete fusion.

Maximum of convergence	p = 10 M. a.
Minimum " "	r = −1.25 M. a.
Breadth " "	a = 11.25 M. a.

This important function exceeded the normal mean. It is well known that in the diagnosis of the paralysis of the vertical motors the horizontal components represent a very inconstant, unsatisfactory symptom. The divergence and crossed diplopia in the paralysis of an oblique not only are frequently absent, but are often replaced by the opposite phenomena. This has caused many to doubt the correctness of the textbooks.

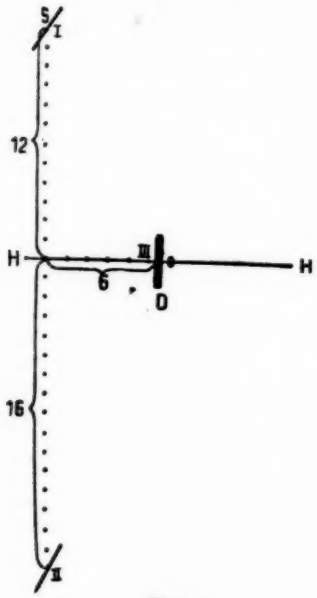

FIG. 3

Bielschowsky has explained this apparent contradiction between physiology and pathology in these cases as follows: If the possibility of fusion is removed on account of a paralysis of a vertical motor, the same thing occurs which we obtain by the use of a vertical prism, namely, the eyes assume their position of rest, their position of equilibrium. If this happen to be convergence, then it may neutralize or even exceed the divergence which is associated with a rectus paralysis. If, on the other hand, the eyes assume a diverging position on the slightest innervation of their muscles, the convergence of an oblique paralysis may be neutralized. If the advancement of the interni in the above case had not completely corrected the

paralysis of convergence, our patient with his paralysis of the inferior rectus would have suffered from a decided divergence. The fact that his eyes, notwithstanding their paretic vertical deviation, no longer diverged as a paralysis of the inferior rectus would lead one to suppose, speaks for the excellent result of an operation performed on the internal rectus.

From a review of my experiences with the advancement of superior and inferior rectus muscles, I have obtained the impression that a greater power acts against an advanced vertical motor than against a horizontal motor. The spasm in the interni in convergent strabismus can be overcome by a paralysis of the accommodation and suppression of fixation. While the internal and external rectus will remain in their new position at the margin of the cornea after operation if the patient keeps quiet, the superior and inferior recti show a remarkable tendency to recede from the point to which they have been advanced by the sutures.

The following rule exists: much more than in an advancement of the horizontal motors must a decided immediate over-correction be sought for in advancing the vertical motors.

A CONTRIBUTION TO THE STUDY OF ENDOGENOUS GONORRHEAL CORNEAL AFFECTIONS.

By Dr. FRIEDRICH PINCUS, Cologne.

Translated by Dr. Alfred Braun, New York.

THE occurrence of metastatic or endogenous gonorrheal conjunctivitis is universally recognized to-day, even though views differ considerably in regard to the frequency or rarity of the disease, depending upon the still arbitrary limitation of the clinical picture and the character of the clinical material observed. In the *Handbuch der Augenheilkunde*, both Groenouw and Saemisch discuss metastatic conjunctivitis in gonorrhea very fully, and Elschnig, who, in the recently published *Handbuch der Geschlechtskrankheiten*, worked up the gonorrheal diseases of the eye, acknowledges, in spite of the scepticism with which he treats the question of metastatic diseases of the eye, the occurrence of the clinical picture of a metastatic conjunctivitis. On the basis of a considerable clinical experience, Heerfordt made a careful study of this disease. He made use of the observations which he made in the division of dermatology and venereal diseases in the Copenhagen City Hospital, where, in the course of five years, 2300 cases of gonorrheal urethritis were placed at his disposal. Among these, he found twenty-three cases of metastatic conjunctivitis. They occurred principally in the bulbar conjunctiva, and developed under the conjunctival surface, often with the formation of phlyctenulæ, so that he thought he could limit the disease more sharply, and he called the condition "subconjunctivitis epibulbaris gonorrhoica." Without going into further details, I wish merely to state that this description of the disease coincides with that given by Elschnig,

and not so much with the descriptions of Groenouw and Saemisch, who mention the prevalence of involvement of the fornix. A case of the latter type has remained vividly impressed upon my memory, and I wish to give a short résumé of it, especially as it remained unilateral, which, according to the statements of all authors, is a very rare occurrence.

On January 17, 1902, I was called to see a patient who had had a gonorrheal urethritis and vaginitis for several months, and who awoke in the morning with an inflammation of the right eye. I found a slight swelling of the lower lid, and a small amount of muco-purulent discharge between the lids and at the inner angle of the eye. The conjunctiva of the lower lid was very much congested, and on forcibly pulling down the lower lid, the markedly edematous lower fornix protruded like a cyst. The swelling extended from the outer canthus to the swollen and hyperemic caruncle. The adjoining ocular conjunctiva immediately above the swelling was slightly reddened, but the remainder of the conjunctiva was normal. We had therefore to deal with a circumscribed edema or serous effusion into the lower fornix, a condition which I had never seen before or since. On the next day, the symptoms had improved considerably, but a very painful exudative inflammation of the left ankle-joint developed overnight. On January 20th—that is, on the fourth day, the eye was entirely normal. The conjunctival discharge was examined repeatedly, without finding a single gonococcus, whereas the findings in the vaginal and urethral secretions were positive.

That we were dealing here with an endogenous gonorrheal conjunctivitis, we can assume with as much certainty as it is possible to attain in a disease in which the negative findings in the secretion are characteristic. Elschnig says, in the above-mentioned *Handbuch:* "If we are very careful in the determination of metastatic diseases of the eye and its adnexa, and consider only really proven cases, especially those with bacteriological examination, we must admit that such metastatic affections belong to the greatest rarities." In another place, he excludes from the reported cases of metastatic conjunctivitis those with positive gonococcic findings in the secretion. However, it must be emphasized that only such cases are to be looked upon as "proven cases," according to his notion, in which it is possible to demonstrate either gonococci or their

toxins in the tissues, a demonstration which, to my knowledge, has not yet been made, and will probably be made very rarely.

Great as are the difficulties in the way of proving the occurrence of endogenous gonorrheal conjunctivitis, they are still greater in the case of endogenous gonorrheal keratitis. Every addition to the literature is therefore of great value. The number of cases of endogenous or metastatic keratitis which have been reported, is very small. They have been collected by Groenouw and by Elschnig, who, however, do not believe that a causal connection between gonorrhea and keratitis has been proven, or is even likely; and especially in a work of Heerfordt, which appeared in 1910, who, on the basis of the above-mentioned material, was enabled to describe the large number of ten cases, and also to illustrate them, and who was the first to compare them with the gonorrheal skin-affections. The difficulties in the way of setting up and limiting this disease as a clinical entity are the following, as was mentioned, in part, by Elschnig. In the first place, gonorrhea is such a frequent and often so lasting a condition, that it would be wonderful if, now and then, a patient did not contract a keratitis, which need have no connection with the gonorrhea. Added to this, is the fact that many patients, and especially those who are most apt to neglect the condition and suffer from a protracted disease, are those who are still comparatively young, and may show the last manifestations of scrofulous ophthalmia. We must, therefore, in order to assure this disease its place in ophthalmology, make certain demands upon the cases described as endogenous keratitis gonorrhoica, which are as follows: in the first place, gonococci must be demonstrated in the discharge from the urethra or vagina at the time of the onset of the keratitis. In the second place, the latter affection must not be the only manifestation of a systemic gonorrheal infection, but there must occur at not too great an interval, either before or after the keratitis, either a gonorrheal inflammation of the joints, tendon-sheaths, muscles, or endocardium, or any other affection which is recognized as a gonorrheal metastasis. In the third place, if a conjunctivitis is present, an examination of the conjunctival secretion must be negative for gonococci, in order to exclude the possibility of an external infection. Finally, we must be

very careful in judging those cases which show an every-day appearance, and arouse the suspicion of the accidental complication of a scrofulosis with the gonorrhea. A solution of this question would be much easier, if we could succeed in building up from the above mentioned description a well-defined uniform clinical picture. Unfortunately this has not been possible, up to the present. However, in the cases published up to the present, certain characteristics recur, as also in the two following cases which I am going to report. I believe that I have the right to report these cases as such, as they fulfill the requirements which I have set forth above.

The first case, which I have treated from time to time since 1907, shows one of those well-known pictures, which is so characteristic of chronic or reinfected gonorrhoics.

On September 18, 1907, I was called to the 31-year-old salesman H., by Dr. Heidenheim, to whom I am indebted for many facts in the history. He was confined to bed by an arthritis in both knee- and ankle-joints, which occurred with a severe anterior and posterior urethritis, with positive gonococcal findings. The infection occurred four weeks before. Two weeks ago, a bilateral conjunctivitis with moderate secretion appeared, which disappeared in a few days, only to reappear two days ago in the right eye, with intense irritative symptoms. Of his previous history, I only just learned from the patient that he had acquired his first gonorrhea in 1896. This lasted half a year. His second attack was in 1900, lasted three months, and was followed by severe rheumatism in various joints, which lasted five or six months. Naturally it is impossible to determine whether each of these was a fresh attack, or a lighting up of an old uncured condition. I found photophobia in the right eye, the lids not swollen, and the conjunctiva of the lids and globe markedly congested. There was slight muco-purulent secretion, which contained no gonococci; I wish to add here, that in all of the succeeding examinations the secretion was negative. In the cornea was seen a row of small superficial rounded opacities, and in the center a larger, irregularly shaped epithelial defect, with a slightly opaque base.

Sept. 19. The secretion and conjunctival congestion have diminished. A large area in the center of the cornea has now lost its epithelium. The small opacities in the periphery are fainter.

Sept. 20. The defect is larger; the base is slightly hazy,

while the upper margin and a portion of the lower margin show a dense white infiltration.

Sept. 21. Although the defect is beginning to cover over, the infiltration in the upper margin has increased, and there is a very small grayish hypopyon.

Sept. 24. The epithelium has completely re-formed; the marginal opacity has diminished, but the center of the former defect shows a parenchymatous clouding.

In the meantime, a similar condition begins to develop in the left eye. In the lower half of the cornea, a few small opacities, and above, an extensive detachment of the epithelium, which still lies loose upon the surface.

Sept. 27. In the right eye, the infiltration has disappeared except for a few vestiges. In the left eye, a large epithelial defect over the entire center of the cornea, with slight haziness of the base.

Oct. 4. Both eyes quiet. The corneæ show slight haziness in the center. Otherwise they are normal. (The treatment consisted of warm sublimate compresses, protargol and atropin instillations.)

The patient now disappeared, and reappeared again in July, 1908. The arthritis had lasted a few more months, and the urethritis, a few weeks; however, there were shreds in the urine for a long time. In March, 1908, he came into the Hospital to be treated for a cardiac affection. He had a mild pneumonia with marked bradycardia and the Stokes-Adams symptom-complex. (The description appears in a work of Huismans.) The nature of the disease remained unexplained.

On July 14, 1908, I found a few faint maculæ of the corneæ, as the remains of the previous disease, and in the right eye, in one of the maculæ, a small epithelial defect, which had already disappeared on July 16. Then there developed an intense iritis, which quickly disappeared under the use of atropin, aspirin, etc.

I then treated the patient in December, 1910, and January, 1911, for an iritis of the left eye. At the same time, he had "rheumatism" in the right elbow, shoulder, and ankle; the last named joint remained swollen for several months. At about the same time, there occurred an intense long-continued urethritis.

On March 13, 1911, the patient appeared with a severe bilateral conjunctivitis, with negative findings in the discharge, which improved under the use of protargol and sublimate compresses.

On March 24, with intense irritation, there appeared, in the center of the cornea of the right eye, a large ruptured epithelial vesicle, with slightly opaque edges.

On March 25, almost healed; the same process in the left eye.

On March 27, right side healed, left side almost healed.

Then another interval until March 4, 1912, when the patient, during my absence, consulted Dr. Kattwinkel, who found an iritis in the right eye. A Wassermann reaction, done at this time, was negative. On March 13, the condition was cured. The urine contained numerous shreds at this time, which, unfortunately, could not be examined for gonococci at this time.

The second case was in a male, L., 54 years of age, who was admitted to the genito-urinary division of the Israelitic Hospital. For the data in regard to the genito-urinary condition, I am indebted to Dr. Spiegel. Twenty years ago, patient had a gonorrhea, which lasted over a year, and was followed by rheumatism, which lasted for several years. Three years ago, he was treated for iritis, first, of the right eye, and then of the left, which lasted five months. The present urethritis began eight days ago. There is anterior and posterior urethritis, with numerous gonococci, and a painful swelling in both ankles. In both eyes, there exists, with photophobia and intense pain, a severe conjunctivitis, with especial involvement of the bulbar conjunctiva, marked venous congestion and numerous ecchymoses, but very slight swelling of the lids. There was very little muco-purulent discharge, which was, and remained, free from gonococci.

Otherwise the eyes were normal, except for some posterior synechiæ in the right eye. Under sublimate compresses and 1% silver nitrate, the condition improved, but on April 10 the cornea of the left eye showed an extensive elevation of the epithelium, with a slightly hazy periphery, which gave the impression of a ruptured vesicle. On the 12th, the defect had healed without leaving a trace, and in the right eye a similar process developed, which healed just as quickly. On April 16, the patient left the hospital with healed eyes, and an unhealed urethra.

On April 23, he appeared in the clinic on account of trouble in the left eye. There was found a group of rounded partly confluent epithelial defects, with slight haziness. They stained intensely with fluorescein.

On April 25, the epithelium had already regenerated, and the stain is no longer taken up.

On April 29, a similar condition appears in the right eye which heals just as quickly.

On May 2, both corneæ are perfectly clear. The urethritis, with positive gonococcic findings was still present in June.

Collecting the important points in the above-mentioned histories, I wish to emphasize the fact that in both cases the requirements set forth above are complied with. In the first place, at the time of the onset of the corneal involvement, a urethritis with positive gonococcic findings was present. In the second place, there were present other signs of gonorrheal systemic infection, in the form of relapsing joint-affections. The iritides in the first case were probably also gonorrheal. In the third place, the conjunctival secretion never showed gonococci. That the condition was not an everyday keratitis is clearly seen from the description. These keratitides seem to have individual characteristics.

In both cases, there was a purely epithelial involvement, in the form of epithelial defects, whose form indicated their origin to be vesicular. A striking fact was the tendency to rapid spread of the epithelial detachment, partly through spread at the periphery, and partly through confluence of several smaller vesicles. In one case there was the formation of a very large vesicle at the beginning. Another striking fact was the rapid healing, which is characteristic of simple epithelial erosions, if there is no infection. In the first case, there was a protracted course with marked infiltration and hypopyon. It is possible that in this case there was a subsequent additional infection from without. The parenchymatous opacities which occur from time to time do not give the impression of being inflammatory infiltrations, but seem rather to be a swelling of the deeper corneal layers, as often occurs with epithelial defects. The rapid onset and spread of the opacities, as well as their rapid disappearance, speak for this origin.

If we look for similar cases in the literature, we find first, in the well-known work of Haltenhoff, "On Gonorrheal Conjunctivitis without Inoculation," Case V, the only one with corneal involvement. In the course of a metastatic conjunctivitis, there occurred what the preceding French doctor called "Herpes de la cornée." Haltenhoff found "numerous epithelial vesicles and a few grayish spots which probably resulted from former vesicles." Coleman describes "A Case of Relapsing Corneal Disease with Gonorrheal Arthritis." "There was a peculiar condition of the corneal epithelium. In certain

areas the epithelium was missing, and in others the cornea was opaque. The corneal substance was not appreciably changed." The conjunctiva was not inflamed. Van Moll read a paper in Utrecht in 1899: "Is there a Metastatic Conjunctivitis?" In the report, in the *Zeitschrift für Augenheilkunde*, I find the following: "The cornea remained intact, but occasionally phlyctenulæ and iritis occur." Here, as in other works, the term phlyctenule means vesicle, whereas the so-called conjunctival phlyctenule is a nodule. From Fuchs's clinic, Kurka reported two cases of "metastatic gonorrheal conjunctivitis." In one case, "there developed in the left eye, in the center of the cornea, a small epithelial defect, surrounded by a grayish ring." The oft cited case of Apetz has an isolated position, inasmuch as it showed large corneal ulcerations with purulent infiltration and exudate in the anterior chamber. Whether this case can be included here is doubtful. In view of its further course, I would not like to exclude it altogether, but will not consider it in connection with this question, as the case only came under the author's observation three weeks after the onset of the disease. During this time, the original picture was undoubtedly obscured by subsequent mixed infection. Apetz cites a similar case of Martin, which was unfortunately not accessible to me. I will also pass over a case of Posey, which, although it showed the picture of vesicular keratitis, yet was the only sign of a general systemic gonorrheal infection. Posey claims to have found gonococci in the cornea, but this finding, as well as the entire nature of the disease, was doubted, in the discussion to his paper.

I come finally to the work of Heerfordt, who describes ten cases of corneal affection, with beautiful illustrations. Without going into each case, I wish merely to state that here, also, the epithelial elevation, phlyctenula or vesicle formation, was the distinguishing characteristic in most of the cases. Heerfordt distinguishes the following forms of the affection: first the vesicular, second the parenchymo-vesicular, which results from the first form, and third the parenchymatous form. As an exceptional form, which occurred in only one of his cases, as well as in the case of Apetz, he mentions progressive marginal keratitis. In regard to the parenchymatous opacities,

it seems to me, after a careful review of his histories, that the same may be said, as in my own cases, namely, that the nebulous character of the opacities and their evanescence preclude the possibility of their being parenchymatous infiltrations, but that they are rather due to the corneal ground-substance imbibing water and swelling up. Heerfordt assumes that the keratitis is always secondary to a gonorrheal subconjunctivitis, and that the irritant substances which cause the inflammation extend along the nerve-pathways, from the conjunctiva into the cornea. Without attempting to go into these theoretical considerations, I wish merely to state that individual attacks in my cases occurred independently of the conjunctivitis, which had long since subsided, and that many of the cases described by the above-mentioned authors, for instance the case of Coleman, occurred without any participation of the conjunctiva. If, furthermore, on the strength of one case, he is inclined to assume, that the parenchymatous clouding is the primary condition, and the epithelial elevation secondary, it is contrary to what has been observed in the majority of cases; and even in his own case, it is possible that loss of epithelium may have preceded the opacities, as the lost epithelium may re-form in a very short while.

I would like to mention the fact that the conjunctivitis, which in both of my cases preceded the corneal affection, simulated, in all its characteristics, the picture which Heerfordt described as "subconjunctivitis epibulbaris."

From my descriptions, it is evident that in the majority of the cases which we are justified in calling endogenous gonorrheal keratitis, we are dealing with a disease of the corneal epithelium, characterized by more or less extensive detachment, with its consequences. Involuntarily, we are forced to compare the condition with the herpetic corneal diseases; the question even arises, as to whether we are not dealing with the occurrence of a herpes corneæ in the course of a systemic gonorrheal infection. With this thought in mind, in my second case, I examined for sensory disturbances, but could find no anesthesia, which can very well be absent in herpes. Be that as it may, it must be admitted that it is a herpes with a very unusual course: in the first place, the great extent of the epithelial detachment, and in the second place, its rapid heal-

ing. Finally, we must concede that in herpes, also, the causation is an injury to the nerve twigs by some toxic substance. This occurs here, through the gonorrheal process, either through gonococci reaching the eye through the circulation, and elaborating their toxines there, or the bacteria remaining at their primary seat, and sending toxines through the circulation. We know very little about the disturbances caused by reflexes from the genital organs. We do know, however, that they play a very important rôle in the pathology of gonorrheal systemic affections.

A few words in regard to the parallel drawn by Heerfordt with the skin affections in gonorrhea. This subject has been very exhaustively studied by Buschke, who divides it into two principal groups:

1. Folliculitis, ulceration, abscess.
2. Gonorrheal exanthemata.

Among the latter, which only concern us here, he designates, as the most common, simple erythema, with vesiculation. Of especial interest to me was a case of marked herpetiform exanthem, reported by Löhe, with a very excellent colored plate. As Buschke points out the possibility of confounding it with a drug exanthem, from the ingestion of balsams, it will not be superfluous to observe that only in the second of my cases was balsam of copaiba given, but only several days after the onset of the eye condition.

In conclusion, to go into the prognosis and therapy of endogenous gonorrheal corneal affections, it is evident that healing occurs quickly under indifferent treatment, unless it is complicated by purulent infiltration.

On the whole, we must hold to the view (in spite of Heerfordt) that, in contrast to the everyday occurrence of gonorrhea of the sexual organs, metastatic conjunctivitis is an uncommon, and keratitis a very unusual, complication.

THE OCCURRENCE OF CATLIKE PUPILS IN MAN

By Professor RICH. GREEFF, Berlin.

Translated from *Arch. f. Augenheilkunde*, Vol. LXXIV., by Dr. Adolph O. Pfingst, Louisville, Ky.

(With four figures in the text and one plate.)

ALTHOUGH the iris has been the subject of as much study as any other part of the human body, we are still encountering new and interesting conditions in this membrane. Apropos of this assertion, I would report a very uncommon condition of the iris of the human in the occurrence of slitlike pupils as we see them in the felines. Four such cases have come under my observation while I have been able to find but two cases in the entire ophthalmic literature. (Case 1, Fehr.)

Case 1. Fehr

In February, 1899, Fehr reported a case of congenital catlike pupil observed in Hirschberg's clinic (*Zeitschrift f. Augenheilkunde*, 1899), in an apparently healthy boy of ten years. He described the pupil of the left eye as identical with that of a cat. (Case 1, L.) In subdued light the pupil was oval and upon strong illumination it took on the form of a narrow elliptical slit. The right pupil was described as a horizontal,

somewhat triangular slit resembling the pupil of a horse. The other recorded case was published by Burstenbinder in 1902 (*Klin. Monatsblat.*). It occurred in a three-months-old baby and was seen in the Allgemeine Krankenhaus of Hamburg. The left pupil extended vertically a little to the nasal side of the middle as a narrow slightly spindle-shaped aperture across the entire iris. (Case 2, Bürstenbinder.) The right pupil extended obliquely across the entire iris with the lower end towards the nasal side. The slit was somewhat wider near its lower end and was described by the reporter as resembling a root. The eyes in both these cases showed no other abnormalities.

CASE 1. Left Eye

Of the four cases coming under my observation, the first was the same case reported by Fehr five years previously. This case took a cylinder lens of 1.25 D. for the right eye, with axis

CASE 2. Bürstenbinder.

75° combined with 1.0 D. sphere, and had $\frac{5}{15}$ vision; for the left eye, 5. D. cyl., axis 75° combined with 3.0 D. sphere, with $\frac{5}{8}$ vision, showing that the direction of the long axis of the pupil and the axis of the astigmatism bore no relation to each other. In the dark both of these pupils became round. My second case (Case 3), seen in private practice, occurred in a female of uncertain age. The right pupil extended almost vertically as a very narrow slit across the iris (the upper end was slightly towards the nasal, the lower towards the temporal, side).

This eye showed a delicate interstitial opacity involving almost the entire cornea. The pupil responded very little to light owing to posterior synechia. Vision $\frac{1}{15}$. The pupil of the left eye was also in the form of a vertical slit, but did not extend to the iris periphery at either end. It was to the temporal side of the middle. Vision $\frac{0.5}{20}$. This patient had

saddle nose, nasal voice, and other symptoms of congenital syphilis.

My third case (Case 4) occurred in the polyclinic of the Charité, in a girl 10 years old. Both corneæ were somewhat smaller than normal; the eyes otherwise normal with the exception of the pupils. The pupil of the right eye was slightly oval and extended from above and outwards towards the nasal side below. Neither extremity quite reached the iris periphery. The edge of the pupil was marked by a slight ectropion uveæ (Plate 1, Fig. a, b, c), and the periphery of the iris especially below was covered by a grayish mass. The left pupil resembled the right, the grayish deposit in the cornea-iris angle being more pronounced, some few bands extending towards the pupil. Remnants of the membrana pupillaris were noted. The right eye measured 5 D. of astigmatism and had only $\frac{1}{15}$ vision. Vision of the left eye was normal.

In my fourth case (Case 5), the right iris had a vertical aperture extending the length of the iris at the junction of its

Case 5. Decking

outer and middle third. The upper end tilted slightly towards the nasal and the lower end towards the temporal side. The pupil was surrounded by a well-marked sphincter zone of grayish color. The rest of the iris was brown. The pupil responded promptly to light. The cornea was marked by a slight opacity at a point corresponding to the lower extremity of the iris. The pupil of the left eye extended as a slit from above and inward to the temporal side below. It was shorter and more narrow than that of the other eye, but was also surrounded by the sphincter colored zone and responded promptly to light. This iris had in addition to the vertical slit an aperture running horizontally or at right angles to the

vertical one and extending from near the vertical slit to the periphery of the iris. This slit was not surrounded by the internal colored zone of a normal pupil and showed no response to light. There was an alternating divergent strabismus in this case. Vision, right eye $\frac{6}{18}$; left eye $\frac{6}{30}$.

Reviewing the five cases again, we note that there was marked similarity in the pupils in all of them—varying only in their direction and extent. The pupils became round or almost so when in the dark. In the second case there was a history of congenital syphilis. The third case was interesting on account of the other coincident abnormalities, as ectropion uveæ, partial persistent pupillary membrane, microcorneæ, and absence of the incisor teeth.

The question of interest in these cases is their pathology. At first glance the pupils seemed elongated by posterior adhesions, but the similarity of the cases, the regularity of the pupillary apertures, and the regular marking of the iris, including the presence of a uniform sphincter zone (annulus iridis minor), would preclude such a possibility. According to Fehr, the malformations in the human are based upon the same structural conditions encountered in the eye of the cat. Instead of forming a ring around the pupil, the muscles of the iris radiate from the pupil towards the iris periphery. The hypothesis has also been advanced that the elongation of the pupil results from congenital coloboma of the iris extending in two opposite directions. Burstenbinder evidently possessed this idea, for in the description of his case he spoke of having an atypical coloboma of the iris in the right eye extending downward and inward and colobomata extending upwards and downwards in the left eye.

The uniformity of the pupillary aperture in the cases described, the acute angles of the pupillary extremities, and the regularity of the sphincter zone about the entire slit would seem sufficient evidence against this hypothesis.

The vertical slitlike pupil is common in lower animals, especially in the feline family. It is also seen in certain birds of prey, the brown owl, some species of snakes and crocodiles. In all of these animals the pupils are large and round when in the dark and become slitlike in the light.

The object of such narrow pupils has been the subject of

considerable discussion among scientists. While it is true that stenopaic vision is made possible through a slit—the narrow round pupil would accomplish the same purpose. Wolfskehl, Matthiessen, and others have expressed the opinion that eyes with long, narrow pupils always have high degrees of astigmatism, and that the slitlike pupil enables the eye to obtain perfect retinal images, at least in the one meridian. However, corneal measurements have disproven this theory, and it is known now that the cat family are not possessed with an unusual amount of astigmatism, and when it does exist its axis bears no relation to the direction of the pupil. The same observation was made in the five reported cases, all of which showed high degrees of corneal astigmatism, but in none of which the axis of the astigmatism corresponded to the axis of the pupils. Fehr has offered as an explanation of this unusual anatomical construction in the human a retrogression of the eyes to a form which was probably common in the early stages of the evolution of man. While this hypothesis probably seems reasonable to the adherents of the Darwin theory, it would seem that the condition would have appeared from time to time before now. It is a reasonable assumption that the peculiar pupils in the five reported cases were not accidental breaches in the iris, but that they were anatomical formations just as they are found in lower animals. Why they should occasionally occur in eyes ordinarily having round pupils, has not been satisfactorily explained.

REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. MARTIN COHEN, Secretary.

MEETING OF NOVEMBER 17, 1913. DR. JOHN R. SHANNON IN THE CHAIR.

Dr. H. H. Tyson presented a case of **double perforation of the globe with foreign body in the orbit.** Patient, a machinist, had a piece of steel fly into his left eye. Treatment with a large magnet and eye-drops. The patient came under Dr. Tyson's observation at the N. Y. Ophthalmic and Aural Institute. An X-ray picture taken by Dr. Dixon showed the size of steel to be 3 x 3*mm*, situated in left orbit 22.25*mm* back of center of cornea, 7.5*mm* above horizontal plane and 9.75*mm* above side of vertical plane. The foreign body had entered the eye at the limbus corneæ, superior nasal quadrant, passing backward and upward into the tissues behind the eye.

Treatment: Atropin locally and sodium salicylate internally. The eye is quiet and white, with no pain. An interesting fact is the presence of good light projection, notwithstanding extensive retinal detachment, which therefore does not absolutely indicate a non-complicated cataract.

Discussion: Dr. Lambert remembered having reported two similar cases at a previous meeting, in which there was excellent recovery.

Dr. Gruening asked whether there was any exophthalmos or limitation of the motion of the eye?

Dr. Johnson recalled a case where bird-shot had passed through the eye, the exit being visible with the ophthalmoscope. There was conjunctival ecchymosis and marked diminution of vision. The eye became normal in two years.

Dr. CHAMBERS had also reported a similar case of shot, followed by epilepsy one year later.

Dr. TYSON closed the discussion, stating that there was no history of exophthalmos or limitation of motion in his case.

Dr. RUDOLF DENIG presented a case of **burn of eyeball, caused by the caustic contents of a golf-ball.** He excised the conjunctiva all around the cornea, covering the defect with a circular transplantation of a lip flap. The deep secondary infiltrations of the cornea disappeared within ten days, patient recovering his sight.

Discussion: Dr. GRUENING had reported a similar case in the Ophthalmological Society, in which he had used the ordinary method in attempting to restore the normal condition. Even if transplantation of the mucous membrane were a panacea for corneal vascular defects, he still believed that it constituted a handicap. Although Dr. Denig had reported 62 similar cases, nobody had found it necessary to adopt his measures.

Dr. CRIGLER had reported a similar case at a previous meeting, which he had treated by the ordinary method.

Dr. DENIG closed the discussion, stating that his operation had been performed in Germany by Dr. Munk, that the case had also been published, but that Dr. Gruening was evidently unaware of the fact. In burns, the conjunctiva was decomposed owing to deep infiltration of the cornea; he therefore removed it and replaced it by a vascular membrane.

Dr. GEO. H. BELL presented an interesting case of **interstitial keratitis** in a young lady who had suffered from this condition in the same eye for 17 years. The cornea was hazy and infiltrated, with the roughened, stippled appearance of this disease. Previous to treatment she had had 100 injections of tuberculin. Wassermann and spinal fluid proved negative. Dr. Bell put her on inunctions and potassium iodide, with the usual local treatment, atropin, dionin, etc., the vision improving to $\frac{20}{70}$. The cornea was still a little hazy, with some deposits in the lymph spaces and a central opacity. The speaker considered this case of tubercular origin, in which mercury and potash acted as alteratives and tonics.

Dr. EAGLETON presented a case of **hemianopsia from**

pituitary disease. The patient, M. F., aged 34, in September, 1911, struck on head and was unconscious for a few minutes. In July, 1912, after a cold, his sight became blurred and he suffered from severe headaches. In November, 1912, the headaches have persisted, with drowsiness. Examination of his eyes revealed a bitemporal hemianopsia. Vision, right, movements of hand in nasal field; left, $\frac{20}{40}$, with nasal contraction for red. A high carbo-hydrate tolerance was present. An X-ray picture revealed an enlarged sella turcica. The vision in the left eye rapidly failed and an operation was decided upon.

The sella decompression was performed in two stages under general anesthesia. Going through the lip, a submucous resection of the septum was done and a large opening made into the sphenoids. The ethmoids were not invaded. There was no hemorrhage and no technical complication, excepting some confusion caused by one sphenoidal sinus completely overlying the opposite one. The operation was followed by immediate improvement in the left eye, with gradual improvement of the right eye.

In February, 1913, vision, right $\frac{2}{200}$; left $\frac{20}{50}$. October 15, 1913, total bitemporal hemianopsia still present. Right vision $\frac{3}{200}$. Greatly contracted field on nasal side for red and green. Left color field normal on nasal side. Vision $\frac{15}{30}$.

Still complains of photophobia and abnormal drowsiness. No headaches.

Discussion: Dr. CHARLES MAY reported four cases, three of which were operated upon by Cushing, and one in this city. In the fourth case, there was a sella decompression resulting in marked improvement in the field of vision, which has remained so for the past two years.

Dr. GRUENING had presented a similar case with **bitemporal hemianopsia** at the Ophthalmological Society, in which the X-ray showed an enlargement of the sella turcica, and where Dr. Elsberg performed the operation by the transfrontal method, removing an adenoma of the pituitary body. There was marked improvement in the general symptoms as well as in the field of vision.

Dr. EAGLETON, in closing the discussion, said that any operation involving the dura was attended with a certain

amount of danger, and that the attempt to reach the pituitary body through the nose was at times impossible. He, therefore, preferred the way along the inferior border of the antrum of Highmore as being more satisfactory and attended with less danger.

Dr. LAMBERT presented a case of **glaucoma with unusual complications.** Patient, a young medical student, suffered from interstitial keratitis of the right eye, from which he recovered. Wassermann negative. Eleven months later he reported a similar attack in the left eye, for which he successfully treated himself without using atropin. There was now present a chronic glaucoma with reduced vision, contracted fields, and deep excavations. Later an anterior chorioiditis was discovered. The Wassermann test was now positive; treatment with salvarsan and mercury. An acute attack of glaucoma now rendered bilateral iridectomy necessary. A very stubborn keratitis again complicated the situation, until after several months the cornea began to clear up, vision in the right eye being $\frac{20}{50}$ with a pin-point pupil.

Dr. ARNOLD KNAPP presented some cases showing **results after trephining** (published in this number).

Dr. JOHNSON, in opening the discussion, thought it would be interesting to hear something about the visual results.

Dr. GRUENING had already stated on a previous occasion that, owing to the dangers attending the Elliot operation, he had refrained from practicing it. Even Dr. Knapp had mentioned detachment of the chorioid, while Axenfeld had reported 15 cases of late infection. In an ordinary iridectomy or the Lagrange operation, these accidents did not occur, and for that reason he contented himself with the latter operations.

Dr. LAMBERT stated that his experience was limited with this operation, but as yet he could not see any great advantage in it.

Dr. REESE did not believe that this operation should be done in acute, but only in chronic, simple glaucoma.

Dr. MAY had performed the operation several times, and his experience with it had been favorable.

Dr. CUTLER asked how a cataract complicating trauma should be handled.

Dr. CHAMBERS regarded the removal of cataract complicating glaucoma as a dangerous procedure.

Dr. WOOTTON referred to Dr. Stevenson's report of cases, in which subchorioidal hemorrhage had followed this operation. He had himself recently performed the Elliot operation in a case of buphthalmos, but is as yet unable to report the final result.

Dr. KNAPP, in closing the discussion, said that he did not go particularly into the visual results, as it required 5 to 10 years to arrive at a definite judgment. As regards the complication of cataract with glaucoma he considered this to be a very dangerous one. He performed an iridectomy or a small trephining first, and proceeded to cataract extraction later when the tension remained reduced.

Dr. CHAMBERS presented a case of a **large cystoid scar following the Elliot operation,** where no iridectomy had been done. He presented the case merely with the object of getting advice as to what could be done to reduce this growth.

Dr. SHANNON, in reply, asked what kind of trephine had been used, and suggested cauterization of the scar.

Dr. CHAMBERS stated that the Verhoeff trephine had been used.

Dr. REESE presented a case of **exenteration of the orbit,** in which a Thiersch graft was used to cover the defect. Removal of the eye was performed on account of a melanosarcoma, a specimen of which was exhibited.

Dr. CLAIBORNE presented a boy of 9 with **bilateral macular changes.** The Wassermann test was negative, and the blood count was normal. There was no central scotoma. Pigment could be seen in both macular regions, but he did not consider this pathological. The fields of vision were irregular, and patient called green yellow. The boy was able to pick up small objects which were placed before him. He presented this case for diagnosis.

Discussion: Dr. WOOTTON recalled seeing this case several weeks ago, and he considered it one of bilateral macular degeneration without cerebral symptoms.

Dr. LAMBERT asked the speaker whether he considered a fundus physiological in which these pigment changes occurred in the macular region.

Dr. REESE considered it a case of retino-chorioidal changes, more marked in the left than in the right eye.

Dr. CLAIBORNE would present the patient again at a later date, this being the best test to find out whether the condition was physiological or not. However, he had seen similar cases which he did not consider pathological.

Dr. MARPLE presented an **electric ophthalmoscope** with battery in the handle and Col. Elliot's device for introducing a mirror.

Dr. MAY thought that the drawback of this instrument consisted in its delicacy and the possibility of breaking the mirror in the pocket on account of its position. He showed one made by DeZeng, in which these objections were avoided. It had also the advantage of interchangeable mirrors. Dr. Wm. S. Dennett had perfected the electric ophthalmoscope as far back as 1885, and he thought he was entitled to some of the credit.

Dr. LESZYNSKY agreed that Dennett should be mentioned in connection with the electric ophthalmoscope.

Dr. WEIDLER presented a new set of **lacrymal probes,** which he claimed to have great advantages over the Bowman and Theobald instruments, by possessing the regulation handle of many of the ophthalmological instruments. This kind of handle gave three or more points of contact, making it a simple matter to balance the instrument and maintain complete control over it. It does not require gripping in order to secure perfect control. The speaker has found it possible to pass one or two sizes larger probes with the new form than with the older ones, without slitting the canaliculi.

Dr. CURTIN has used this instrument recently and considers the handle an excellent device for securing control of the probe.

Dr. CLAIBORNE thought that the handle could be shortened.

Dr. WEIDLER next presented a case of **melanosarcoma,** in a woman, 65 years old. For the macroscopic examination a section was made through the middle of tumor after 4 days' hardening in formalin. The iris was pale blue and there was no layer of pigment in the stroma. The tumor is yellowish white and there are several small dark vessels. From the microscopic examination, the tumor seems to have begun in the vascular layer of the stroma, being more or less limited to

the pupillary portion of the iris and growing into the anterior chamber. The layer of pigment cells nearest the tumor shows a tendency to break loose. The blood-vessels in the tumor are quite abundant and are supplied from various sources. They also explain the hemorrhages into the anterior chamber. One of the vessels could be seen on the surface of the growth before the eye was removed. The sarcoma is made up of the small and spindle types. The growth is extending into the iris toward the periphery, principally on the anterior surface, where the layer of endothelial cells is entirely absent over the surface of the growth. The growth has almost reached to the angle and shows the wisdom of removing the eye. Pigmentation is not marked, but sufficiently so to call it a melanosarcoma.

MEETING OF DECEMBER 15, 1913. JOHN R. SHANNON, M.D., CHAIRMAN.

Dr. H. H. TYSON presented a case of a **hole in the macula.** About eight weeks ago, patient, a woman, had a stinging pain in her left eye, lasting intermittently for two days and followed by asthenopia. She had occasional attacks of rheumatism for five years, and there is mitral stenosis. The fundus of the left eye shows thrombi of the retinal vessels with hemorrhages in the retina and upon the optic disk, with floating opacities in the vitreous, and a hole in the macula about eight millimeters in size and of a somewhat darker red at the bottom than the normal fundus. The edge of the defect was oval and appeared raised and thickened. Vision in left eye nil; right eye $\frac{20}{20}$, with a normal fundus.

The case belongs to the non-traumatic variety described by Fuchs, in which he assumes hemorrhage of the macula, necrosis and absorption of the tissue, leaving a hole at its site.

Dr. E. J. CURRAN presented a case of **chorioretinitis with ring scotoma** (pigmentosa type), observed at the Herman Knapp Memorial Eye Hospital. Patient, 46, had had soft chancre, buboes, and gonorrhea. Wassermann negative. Vision began to fail 14 years ago. Now, R. and L. $\frac{20}{100}$, retina pale with irregular pigment in the postequatorial zone. Some chorioidal pigment at disk and near equator. Disk moderately pale. Physiological cup shallow. Exudate in right eye. Pigmentary changes more pronounced in left eye. Both

fields show ring scotoma corresponding with the postequatorial zone and coalescing with blind spot. Central field 10°, with good color perception. Periphery contracted and here color perception for red is almost normal, but entirely absent for blue.

The speaker thought this to be a typical case of retinitis pigmentosa, beginning in the chorioid. In his opinion three types of this affection should be recognized: (1) beginning in the chorioid with an irregular distribution of pigment, as the case shown to-night; (2) beginning in the retina and spreading back to the chorioid; (3) beginning simultaneously in the retina and chorioid. The lymph is altered in this disease probably, as Doyne suggests, as a result of a perverted selection of the retinal tissue. The speaker thinks that this alteration can be accounted for on an anatomical basis. There is a chronic, slowly progressing lymph stasis, the location of which determines the three types of the disease, but besides he suggests that this is essentially a local toxic state. The sclera is especially prone to sclerotic changes, and if the lymph spaces are lessened, the flow of lymph from the postequatorial zone is reduced and the toxic products of metabolism will accumulate. This local toxic condition is proved by the stimulation of the retinal pigment cells and the increase in the retinal fibrous tissue. The forward movement of retinal pigment could be accounted for by osmosis on account of alteration of these fluids. If the retardation were more marked at the disk, the retina would be more involved. Again, the retardation could take place in both places simultaneously in cases of ring scotoma, pass unaffected through the pathologically altered tissue, and could conduct color sensations to the central nervous system. Here the ganglion cells are able to obtain nutrition which is not surcharged with toxic products and are therefore kept in a functional state.

Dr. DUANE, in opening the discussion, showed some illustrations of the field of vision in chorioretinitis and toxic amblyopia. One was a case of ring scotoma which resembled a retinitis pigmentosa. This patient had a hemeralopia, a patch of chorioretinitis atrophica, encircling the disk. Vision was also markedly affected. Under mixed treatment both hemeralopia and vision improved. Another case was one of ring scotoma which developed into a central scotoma.

Dr. WEEKS asked Dr. Duane whether both eyes had been involved in these two cases, to which Dr. Duane answered in the affirmative. He added that the development of this ring scotoma was due to hypertrophy of the retinal pigment and to interference with the circulation of the chorio-capillaris, causing nutritional disturbance.

Dr. H. W. WOOTTON presented a case of **hypophyseal disease,** operated upon by the transsphenoidal route. Patient, a girl of 19, could not recognize light with the left eye, and vision of the right eye had been failing for some time. Personal and family history of no importance. Central cornea opacities in both eyes. R. $\frac{15}{200}$, L. no p. l., and no direct pupillary reaction. Right nerve head atrophic, left pale. Field, O. D., temporal hemianopsia. Condition could be due only to disease of the chiasm. Radiograph showed enlargement of the sella turcica and deformity of the clinoid processes. Wassermann negative. Transsphenoidal decompression performed by Dr. Coffin. Mental condition improved and headache no longer continuous. Previous mercurial treatment did not give any relief.

In the discussion, Dr. GRUENING asked whether a piece of tumor had been removed for microscopic examination, and Dr. Wootton explained that no piece had been removed because the operation had been done only for decompression.

He also thought that the transfrontal route was more rational and less dangerous.

Dr. ALEXANDER DUANE presented a case of **inflammatory tumor formation of orbit.** Patient, a middle-aged woman, came to the clinic two years ago, to be examined for glasses. There were erosions on the cornea, ptosis, and dislocation of the lacrymal gland right underneath the orbital margin. Operation was advised and performed by Dr. Arnold Knapp over a year ago. After the usual incision over the growth at the outer margin of the orbit, the tumor mass was reached. It was attached to the periosteum, involving the lacrymal gland, but not the bone. It was about the size of a pigeon's egg. To remove it, would have necessitated the sacrifice of the eye; a small piece was therefore removed for microscopical examination, the wound healing with primary union. Examination of this growth showed either a granuloma, lymphoma, or

tuberculoma. Tubercular and Wassermann tests proved negative. Patient showed no reaction after the operation. Some iodide treatment was administered, but patient refused mixed treatment ordered by her family physician. After a year, patient returned with normal appearance of the eye, which has remained so up to date. During that time, no treatment was instituted. In the following winter, she took a small dose of red iodide of mercury. Remarkable is the spontaneous disappearance of the growth which at its early stage appeared to be malignant; also the disappearance of the erosions.

Dr. GRUENING asked whether patient had had mixed treatment before, to which Dr. Duane replied that none had been had before and very little after the operation.

Dr. JOHN R. SHANNON presented a case of **caustic burn, with interesting complications.** The patient, while making soap, received a quantity of the mixture, which contained about 12% of caustic potash and soda, in the face. The right eye was severely burned, the left slightly. The lids of the right eye were greatly swollen, the conjunctiva was edematous, and the cornea over its lower two-thirds nebulous. Atropine in oil, with applications in ice, was instilled, and in about three weeks there began a series of hemorrhages into the anterior chamber. The patient was put to bed, and the hemorrhages ceased. Pain and congestion of the ball appeared, and the tension increased. Myotics with hot applications were substituted for the previous treatment, but the symptoms not being relieved, iridectomy was performed. Then symptoms reappeared, trephining was done, and improvement was prompt. The iris did not present in the trephine opening, and no iris tissue was removed; but filtration was excellent. Now, after three weeks, the vision is increased from light perception to $\frac{6}{100}$.

Dr. WALTER B. WEIDLER presented a case of **tumor of the iris.** Patient, a man of 25, gave a history of chancre, for which he has been under treatment. When he came to the clinic ten days ago, the cornea was hazy and a mass springing from the pupillary margin of the iris. Wassermann positive. Under mixed treatment the growth was resolved to about half the size and the cornea became clear.

Dr. GRUENING wished to call attention to the fact that these cases will get well under mixed treatment, without having recourse to salvarsan.

Dr. WILLIAM H. WILDER of Chicago (by invitation) read a paper on **Ocular sporothricosis** which was illustrated by lantern slides. He also reported a case.

Sporothrix was first described by Schenck in 1898, and two years later by Hektoen. In most of the cases, the skin has been the seat of the lesion, but in the present case the primary lesion was on the conjunctiva, a laboratory student having infected his eyes with the organism.

There was increasing soreness of both eyes, photophobia, lacrymation, and swelling of the lids. The conjunctivæ of the latter were reddened and so swollen that the fornix rolled out in a mass when the lids were everted. Grayish yellow, slightly elevated, ulcerating spots, from 0.5 to *2mm* in size, developed on the palpebral conjunctiva and the fornix; numerous follicles appeared in other portions. The preauricular glands became swollen and tender.

Cultures made at room temperature developed, in about 5 days, characteristic sporothrix colonies.

Temperature 101°, leucocytosis 18,000. Other general symptoms developed showing general infection such as pain in the left knee, the left elbow and wrist, and the patient was put to bed. Twelve days later, the temperature was unchanged, but the ulcers were healing and the swelling of the lymph glands was receding. In another week, the swelling of the conjunctiva had somewhat subsided and the ulcers had healed, but it was two months before the follicles disappeared and the conjunctiva presented a normal appearance.

The treatment included irrigation of the eye with oxycyanide of mercury solution 1: 6000, application of tr. of iodine to the ulcers, and potassium iodide 20 grains three times daily.

The lecturer reviewed the histories of a number of cases of sporothrix infection of the eyes reported by French observers and also that of the only other American case of sporothricosis of the conjunctiva reported by Gifford in 1910.

The disease presents some points of similarity to Parinaud's conjunctivitis, in the general infection and the lymph-adeno-

pathy. The presence of Gram-positive spore-like bodies in a direct smear from the ulcers of the conjunctiva should suggest sporothrix, and cultures from scrapings develop the organism in from 3–10 days.

Dr. SIGMUND POLLITZER (by invitation) remarked that sporotrichosis falls into the domain of the dermatologist. It is probably far more common than the number of recorded cases would indicate, and it simulates the tertiary lesions of syphilis so closely that many cases would go unrecognized, especially as the lesions healed promptly under potassium iodide. Of 150 cases recorded to date, fully two-thirds have been observed in France, and the French writers have rather ignored the fact that the credit for the first complete description belongs to America. Schenk's work, in 1899, and Hektoen and Perkins's in 1900, antedate de Beuemann's by 3 and 4 years, respectively. It must be admitted, however, that we owe to the French authors our present, fairly complete knowledge of the affection.

There are either disseminated lesions which soften and break down into gummatous ulcers, or gummatous lymphangitis. There may also be simultaneous chronic fistular lesions in connection with sporotrichotic foci in the bones and mucosa, which are due to infection by way of the alimentary canal. In one of the few cases recorded in this country by Dr. Hyde, the patient was probably infected through contact with horses on a ranch in North Dakota where there was an epidemic of the disease.

The positive diagnosis is made in the laboratory. An agglutination test gives (1) an immediate response in dilutions up to 1:200; (2) cultures which require from 6–12 days for development; and (3) a local sporotrichosis reaction after intracutaneous injection, a procedure analogous to the luetin reaction of Noguchi. Inoculation tests on animals are not always successful; intraperitoneal injections in rats yield the most constant results. As negative evidence, the exclusion of tuberculosis and syphilis is important.

Dr. JAMES G. DWYER has had a case in conjunction with Dr. LARKIN. Patient had infected his finger, leading to abscesses all over the body and also affecting the lids. The organism did not show until 11 days after the infection. There was agglu-

tination reaction of 1:15,000, and there was early leucocytosis. In regard to diagnosis smears are not of much value, while everything depends upon the growth of cultures. He has also made a complement fixation test. In the clinical examination, the affection may be mistaken for gumma or tuberculosis, giant cells being present in both. With regard to treatment, potassium iodide has the effect of dissolving the granulations.

Dr. LAPOWSKI confirmed the previous speaker in stating that **sporotrichosis** was mostly known as a skin disease and that a differential diagnosis as against gumma, folliculitis, and tuberculosis was very difficult. Only a suspicion may be aroused, and all the clinical methods of investigation must be used to exclude the presence of sporotrichosis. The relation of the Wassermann reaction to this affection was as yet unknown, as but few cases had been subjected to it. In the two cases mentioned, the infection occurred on a healthy surface of the eye, analogous to gonorrheal infection. The local focus disappears after the use of potassium iodide, but as sporotrichosis is not only a local disease but also a systemic one, involving internal organs, it is important to know whether such involvement does not occur months or even years after the first infection.

REPORT OF THE TRANSACTIONS OF THE SECTION ON OPHTHALMOLOGY OF THE ROYAL SOCIETY OF MEDICINE.

By Mr. C. DEVEREUX MARSHALL, F.R.C.S., London.

The ordinary meeting of the Section was held on Wednesday, December 3d, under the presidency of Sir Anderson Critchett, Bart., C.V.O.

Mr. Cole Marshall showed a case of **staphyloma posticum verum;** Mr. Leslie Paton, two cases of **rodent ulcer** treated with CO_2; Mr. Macnab a case of **infiltration in and around the iris;** and Mr. Grimsdale a case of **microphthalmos.** Mr. Herbert Parsons showed specimens of experimental glasses prepared by Sir William Crookes, O.M., P.R.S. They were synthetically prepared glasses. Sir William Crookes had two soda fluxes made by Messrs. Powell, and added to these specimens of flux certain metals in definite proportions. He then made the glasses in small quantity, cut slices, polished them, and investigated their properties in reference to transmission of heat, and he had taken photographs of the absorption of ultra-violet rays with a quartz spectrograph to test their transmission of luminous rays, and estimated their color with the tintometer. In order to test with the greatest possible delicacy, Sir William invented an exceedingly delicate instrument named the radiometer balance. He made a glass which cut off 96% of the heat. The subject was of much wider importance and applicability than the research seemed at first to show.

Dr. Morrison Legge, of the Home Office, spoke at considerable length on the subject. He said glass-workers' cataract was brought to his notice as a member of the Depart-

mental Committee which set to enquire into the question of compensation for industrial diseases, in 1906; and much valuable information was forthcoming from a very intelligent secretary of a glass-workers' association. The late Mr. Simeon Snell set himself to collect information on the subject, but his method was not calculated to yield the truest results, for he circularized the manufacturers themselves, asking how many cases of cataract they had known among their workers. As a result Mr. Snell came to the conclusion that cataract was not specially prevalent among glass-workers. A systematic examination of workers for the condition might result in men having the condition being discharged, whereas it took ten to twelve years to prove disabling. He, Dr. Legge, went himself into the glass factories of St. Helens and Sunderland, and he was very much impressed by the number of men who came up showing this cortical cataract, varying in size from a pin's head to what looked like a large blot of ink in the center of the pupil; it was quite different from the peripheral striæ in senile cataract. He was struck by the small degree to which the eyesight of the patients suffered. In only very few cases were there opacities in the cornea.

The President, in thanking Dr. Legge for attending and making his valuable contribution, said that in Italian glass-works the workers were much nearer the flame, and it was very rare indeed to find a worker of forty years of age whose cornea was not affected.

Mr. N. Bishop Harman read a contribution, and showed photographs, on an operation to improve the effect of an artificial eye. His object was to render the loss of an eye less conspicuous. He remarked that, other things being equal, the effectiveness of the disguise was controlled by the shape of the palpebral fissure. With a small fissure, the shell was effective; with a wide and generous form of fissure, the shell provided insufficient support, so that the lids dropped away, deep sulci marked the lids, and the shell was exposed in its naked bareness. The operation aimed at doing for the large-eyed what the small-eyed had by nature. The lids were secured in a clamp, devised for the purpose, then split at the inter-marginal space and the raw surfaces brought together so as to shorten the fissure. The lid surfaces were protected from scarring by the

suture, by rubber guards that also afforded elastic pressure. On the fourth day the suture was removed and any adjustment of an excessive effect could be made. The effect of the narrowing of the fissure was to draw forward the lids, slightly cover the shell, and shadow it, so that in place of the fixed stare there was a slight and subtle wink. The pull of the lids against each other tended to smooth out the deep sulci above and below; the relative movement of the shell was also improved. The effect was to make the beholder of the face concentrate on the natural eye, which became the fixative feature of the face. In the words of an early poet, it became a face "with one suspicious and one drooping eye"; the slightly winking, drooping eye was a companion inconspicuous by reason of its lesser character.

Mr. W. M. BEAUMONT read a paper on **Iritis, rheumatic and toxemic.** He said doubts had been thrown upon the existence of a rheumatic form of iritis, and modern views of the nature of rheumatism seemed to coincide with those doubts. The author, earlier, had been a sceptic, and his views had found expression on several occasions in the columns of the *British Medical Journal*. Poynton and Paine's invaluable researches, based on bacterial experiment, had stimulated interest, whilst the papers read at the annual meeting of the British Medical Association and at the International Medical Congress brought the subject again to the front. A difficulty arose in Poynton and Paine's results because iritis associated with acute rheumatism was so extremely rare that it might be considered negligible; whereas these investigators had been able, on at least two occasions, to produce iritis by the intravenous injection of the products of rheumatic infection into rabbits. A negation of rheumatic iritis seemed to be a natural corollary of the "passing" of rheumatism, and it seemed to the author that their experiments almost proved too much. He thought that a more extended view of the frequency of toxemia, and especially of gonorrhea, as a cause of iritis, would be the outcome of further research. But, as in the past, it had been usual to parcel out the different causes of iritis, without including toxemia as one of them, it was clear that if that factor were generally accepted, it must very considerably reduce the percentage of some of the fully recognized causes.

He thought that the class that would be materially reduced would be the nondescript one "rheumatic."

The paper was discussed by Mr. Lawford, Mr. Herbert Fisher, Mr. Cobbledick, Mr. Mayou, Dr. Thompson, and the President, and the author replied.

QUARTERLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

By H. KOELLNER, Berlin; W. KRAUSS, Marburg; R. KÜMMELL, Erlangen; W. LOEHLEIN, Greifswald; H. MEYER, Brandenburg; W. NICOLAI, Berlin; H. PAGENSTECHER, Strassburg; K. WESSELY, Würzburg; and M. WOLFRUM, Leipsic, with the Assistance of Drs. ALLING, New Haven; CALDERARO, Rome; CAUSÉ, Mayence; DANIS, Brussels; GILBERT, Munich; GROENHOLM, Helsingfors; v. POPPEN, St. Petersburg; TREUTLER, Dresden; and VISSER, Amsterdam.

SECOND QUARTER, 1913.

Edited by MATTHIAS LANCKTON FOSTER, M.D., New Rochelle.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

See Book Reviews.

II.—RELATIONS OF OPHTHALMIC TO GENERAL DISEASES, INCLUDING POISONS.

1. CALHOUN, F. P. **Eye complications caused by hookworm disease.** *Jour. American Med. Association*, Sept. 21, 1912.

2. FRIEDMAN, L. **Temporary toxic amaurosis and paralysis following injection of ethyl alcohol into a chronic empyema sinus.** *Ibid.*, Nov. 13, 1912.

3. GIFFORD, H. **A case of the juvenile form of family amaurotic idiocy.** *Ophthalmic Record*, Nov., 1912.

4. HEGLER. **Diabetic lipemia.** *Muench. med. Wochenschr.*, No. 16, p. 897.

5. HEINE. **The height of the brain pressure in some diseases of the eye.** *Ibid.*, No. 24, p. 1305.

6. HILLION. **Bilateral metastatic ophthalmia following pneumonia.** *Arch. d'ophtalmologie*, xxxiii., p. 297.

7. PETERS. **Blue sclera and fragility of bones.** *Klin. Monatsbl. f. Augenheilkunde*, May, p. 594.

8. ROESSLER. **Metastatic ophthalmia.** *Ophthalmic Society of Vienna*, June 2, 1913.

9. WEILL, ANDRE. **The symptoms of azotemia.** *Annal. d'oculistique*, cxlix., p. 356.

10. TYSON, H. H. **Amblyopia from inhalation of methyl alcohol.** *Trans. Amer. Oph. Soc.*, 1912.

11. WELTON, C. B. **A case of quinine amblyopia.** *Annals of Ophthalm.*, Oct., 1912.

12. WIRTZ, R. **Relations of rheumatic diseases of the eye to "secondary" tuberculosis.** *Klin. Monatsbl. f. Augenheilkunde*, May, p. 607.

13. WOOD, C. A. **Nasal hydrorrhea.** *Jour. A. M. A.*, Sept. 21, 1912.

14. WORTHINGTON, Major H. **Report of a case of mumps with interesting ocular complications.** *Ophthalmology*, April, 1913.

It has long been known that anemia and edema of the retina and disk and retinal hemorrhages are often associated with hookworm disease. CALHOUN (1, **Eye complications caused by hookworm disease**) mentions a number of cases of cataract which he thinks are due to the toxins which are generated by the hookworm and cause derangement of the nutrition of the lens.

ALLING.

HEINE (5, **Height of brain pressure in some diseases of the eye**) assumes as the height of the physiological brain pressure 150*mm*, which is fairly high. The possible connections between an increase of this pressure and a disease of the eye are: (1) The eye affection is the result of the increased brain pressure; (2) the increased pressure is the result of the eye disease; (3) both are due to a common cause, such as syphilis or tuberculosis. Under the first possibility he groups cases of nystagmus and of neurotic corneal affections. In 25 cases of nystagmus the pressure was below 150 in 7, above in 18; 9 between 200 and 300; 2 above 300. Nineteen of these cases were certainly congenital, and of these the brain pressure was increased in 14; this indicates a primary brain affection with increase of pressure. The visual acuteness is not unquestionably dependent on the nystagmus, for perfect vision may coincide with regular nystagmus, and nystagmus often does not develop in spite of early amblyopia. In 5 there was a slight pallor of the papilla, usually on the temporal side. Among the neurotic corneal affections he includes herpes corneæ, herpes zoster, keratitis dendritica, neuroparalytica, bullosa, and dystrophia epithelialis. The increase of brain pressure was demonstrable in 22 out of 23 cases. Therefore, he thinks an increase of brain pressure to be the most common cause of herpes and of allied affections, the more so as very

evident benefit can be obtained sometimes by the artificial reduction of the pressure by lumbar puncture.

WEILL (9, **Symptoms of azotemia**) describes the symptoms that indicate an overloading of the blood with nitrogen in nephritis, a menacing uremia. Together with the torpor, which increases to somnolence and coma, and with the anorexia, an albuminuric retinitis is closely connected with the amount of nitrogen in the blood. He has seen 66 cases of this nature in which a greater or less retention of nitrogen in the blood could be demonstrated; in 21 of these the retinitis led to the discovery of the disease. The lesion in the eye frequently exists without causing the patient any subjective trouble; therefore all nephritics should be examined systematically. Weill found the disease of the retina in 33% of the patients with nephritis whom he examined, and 54% of these had an increased amount of nitrogen in the blood—azotemia. With regard to age, 41 of the patients were between 16 and 40; 25 were older. The presence of fatty and lipoid constituents in the retinal patches he explains from the hypercholesterinemia and lipemia of Bright's disease. Another important symptom of the overloading of the blood with the constituents of urates is pruritus, which was present, together with the retinitis, in 6 cases. A change in the composition of the blood is shown clinically in a special anemia, paleness, and occurrence of hemorrhages. Examination of the blood reveals disturbances of coagulation, diminution of the red blood corpuscles, signs of the renovation of the blood without myeloid elements, and a constant leucocytosis in which the polynuclear elements prevail. The content of nitrogen in the blood should be systematically determined in every case of Bright's disease, for the prognosis is thus indicated: If the content is between 0.5 and 1*g*, there is no immediate danger; if it is between 1 and 2*g*, the patient rarely lives a year; if between 2 and 3*g*, life will last only a few weeks or months; more than 3*g* occurs only in the last stages of the disease.

CAUSÉ.

HEGLER (4, **Diabetic lipemia**) describes a case of diabetes with a high degree of lipemia. The latter was particularly marked in the fundus, where the retinal vessels presented a silver-white appearance from the papilla to near the equator.

The total content of fat in the blood amounted to 20%, that in the blood serum to 33%.

WIRTZ (12, **Relations of rheumatic diseases of the eye to "secondary" tuberculosis**) examined 21 patients, 6 with episcleritis, 14 with iridocyclitis, and 1 with sclerokeratitis. Tertiary tuberculosis was present in 9. In all the rest tubercle bacilli could be demonstrated in the blood, while all gave a history of rheumatic diseases. Most of the patients had a sick appearance, had tuberculous constitutions, in spite of the fact that no local lesion could be found, and although they felt well. In addition to the local treatment of the ocular disease the tuberculosis must be treated if a perfect cure is to be secured. He makes the diagnosis of "secondary" tuberculosis from the sick appearance of the patient, taken in conjunction with a history of scrofula in childhood, or tuberculosis in the family, and a positive tuberculin test.

FRIEDMAN (2, **Temporary toxic amaurosis and paralysis following injection of ethyl alcohol into a chronic empyema sinus**) injected 25*cc* of pure alcohol into a sinus connected with a bronchus. His patient immediately became unconscious and later lost his vision except for light perception for about an hour. There was also paresis of the upper and lower extremities. No ophthalmoscopic changes were noted.

ALLING.

WELTON'S (11, **Quinine amblyopia**) case was an alcoholic who took within four hours 55 gr. of quinine and a quart of whiskey. The disks showed atrophy and the vessels were greatly narrowed. The visual fields were contracted for form and color.

ALLING.

GIFFORD (3, **Juvenile form of family amaurotic idiocy**) recites the case of a girl who at the age of 7 began to fail in mental condition and to lose her sight. When examined she was 11, and was abnormally quiet and childish. There was excentric fixation, but sufficient vision to enable her to find her way about. Divergent strabismus and slight nystagmus were present, and there were dust-like opacities in the vitreous, atrophic nerves, and pigment masses resembling those of retinitis pigmentosa, but larger. Four years later the child died totally blind in a hospital for the incurable insane. An older brother had a similar history. Five other children in the

family were healthy. He also speaks of four children in another family who developed normally up to the age of 7 or 8, and then were obliged to drop out of school on account of failing vision and lack of mental ability. Similar cases are well known and have been reported by Batten, Mayou, Vogt, Oatman, and others. Most observers agree that these cases are allied to the infantile form of family idiocy. The pathological condition of the brain is essentially a degeneration of the ganglion cells. There have been only three microscopical examinations; they showed complete degeneration of the rods and cones as well as of the other layers of the retina, thus differing from the infantile form, in which the rods and cones are found to be normal. ALLING.

The correlation between blue scleras and fragility of the bones, concerning which English writers have contributed a number of examples, is corroborated by PETERS (7, **Blue sclera and fragility of bones**), who met with a family thus afflicted. The father had had his bones broken four times by insignificant causes, one son had suffered in the same way twice, and another son was in the hospital with a fracture at the time of writing.

Among the ocular complications following mumps are abscesses of the lids, dacryocystitis, iritis, keratitis, retrobulbar neuritis, and optic atrophy. WORTHINGTON (14, **Mumps with ocular complications**) reports a case of keratitis during convalescence. He found a general interstitial haziness of the cornea of one eye, presenting a stippled appearance, with some congestion. Recovery was complete.

ALLING.

HILLION (6, **Bilateral metastatic ophthalmia following pneumonia**) gives the clinical history of a case of this nature in a man 45 years old. Toward the end of the febrile disease a fibrino-purulent conjunctivitis set in. The swelling of the lids, protrusion of the eye, chemosis, and membrane formation were so great that at first an accurate examination of the eye was impossible. Two doses of Roux's antidiphtheritic serum were injected, one of 30, the other of 15*cm*. Bacteriological examination of the fibrinous deposit and of the blood gave no positive result. On the third day the fibrinous secretion decreased and then the yellow color of a purulent vitreous could be seen through the pupil. The temperature was

slightly elevated. Suppuration attacked both corneæ. Both eyeballs became atrophied, so that at the end of two months they were hardly as large as peas.

CAUSÉ.

ROESSLER (8, **Metastatic ophthalmia**) reports a case of benign metastatic ophthalmia that occurred during follicular tonsillitis in a woman 46 years old. The patient had an attack of sore throat, and on the next day her left eye was blind and painful. The eye was greatly injected and showed an iritis with deposits on Descemet's membrane. The media were clear. Adjacent to the otherwise normal papilla the retina was white and opaque above and below, especially along the large vessels, and elevated 3 D. The portion toward the macula was intensely white and sharply defined. There were some hemorrhages, but the vessels were otherwise normal. Vision was fingers at 1*m*. Twelve days later an attack of glaucoma supervened, which was controlled by puncture, and the vision rose to fingers at 2*m*. The prominence of the retina was 4 D. The blood and aqueous were free from bacteria. This was a benign metastatic ophthalmia similar to those that have been reported by Holmes, Spicer, and Schuessele.

TERTSCH.

WOOD (13, **Nasal hydrorrhea**) thinks that this condition is a symptom and not a disease. In the majority of cases there is optic atrophy. The discharge he believes to be cerebro-spinal fluid. The underlying cerebral disease is frequently hydrocephalus, and the increased pressure gives rise to seepage of fluid through one or more basal openings.

ALLING.

According to TYSON (10, **Amblyopia from inhalation of methyl alcohol**), thirteen cases of this form of poisoning have been reported. He relates the case of a man who was employed in shellacking the interior of beer vats. He always wore gloves. His vision failed to counting fingers in the peripheral field. There was optic neuritis and retinal edema. Under treatment he later recovered central vision with contracted fields and atrophic nerves. Two additional cases occurred in women using varnish made from wood alcohol. They complained of headache, dizziness, and obscurations. The optic disks were blurred and the veins dilated. The symptoms

appeared after working for a few hours in a closed room. He believes that denatured alcohol should be substituted for wood alcohol in the arts and trades.

ALLING.

III.—GENERAL AND EXPERIMENTAL PATHOLOGY AND TREATMENT.

15. BOCK. **Treatment of scrofulous and tuberculous diseases of the eye with immune bodies.** *Wiener med. Wochenschrift*, Nos. 19 and 20.

16. DE SCHWEINITZ, G. E. **Treatment of various forms of ocular syphilis with salvarsan.** *Therapeutic Gazette*, May 5, 1912.

17. DESNEUX. **A case of neurorecidive.** *La Clinique*, May 10, 1913.

18. HERTEL. **The diminution of the tension of the eye in diabetic coma.** *Muenchener medicinische Wochenschrift*, No. 22, p. 1191.

19. KAHN, MORRIS H. **Post-mortem ophthalmoscopy; segmentary intravascular coagulation.** *Medical Record*, May 3, 1913.

20. LEVIS, H. J. **An eye lesion following two intravenous injections of salvarsan.** *Jour. A. M. A.*, May 3, 1913.

21. MAYOU, S. **Serum and vaccine therapy in connection with diseases of the eye.** *Annals of Ophthalmology*, Oct., 1912.

22. ROHMER. **Autoserumtherapy in ophthalmology.** *Arch. d'ophtalmologie*, xxxiii., p. 193.

23. ROLLET and AURAND. **Experimental studies of the intraocular action of new metals.** *Revue générale d'ophtalmologie*, xxxii., p. 193.

24. SUKER, G. F. **Use of conjunctival flap in perforating wounds of the eyeball.** *Illinois Medical Journal*, Nov., 1912.

25. WERNICKE. **Neurorecidive after salvarsan treatment.** *Zeitschrift f. Augenheilkunde*, v., p. 434.

KAHN (19, **Post-mortem ophthalmoscopy**) has observed that certain interruptions occur in the blood column of the retinal vessels, more especially in the veins, *post mortem*. These interruptions depend on intravascular coagulation; the shrinking of the clots in some places causing them to separate and form spaces which contain the serum that is expressed. This condition sets in shortly after death, but too few cases were examined to give exact data.

GROUT.

HERTEL (18, **The diminution of the tension of the eye in diabetic coma**) attempts to explain the cause of the extreme hypotony often to be seen in diabetic coma, for the local changes or a fall of the blood pressure do not come into account. The heightening of the electric conductibility of the ocular fluids in such soft eyes suggests a disturbance of the

osmotic processes in the eye. Such a hypotony can be obtained in rabbits by overfeeding and the intravenous infusion of various salts, including sugar and urea, whence it appears that it may be produced in these animals by a change in the molecular composition of the blood which is referable not to a specific action of the substances employed, but to a change in the osmotic processes.

ROLLET and AURAND (23, **Experimental studies of the intraocular action of new metals**) have studied experimentally the intraocular action of the modern alloys of iron with aluminium, nickel, tungsten, and chrome, comparing it with those produced by iron and copper. Pieces of metal of the same size, sterilized by 140° C., were introduced into the eyes of rabbits, the anterior chamber, iris, ciliary body, and vitreous. These studies show that aluminium, iron, and steel in the anterior chamber cause the formation of a delicate, fibrinous pseudomembrane, while nickel and chrome excite a purulent inflammation in the anterior chamber and iris, the same as copper. Nickel and copper likewise induce degenerative changes in the retina and vitreous. Aluminium is borne well in the vitreous. In the ciliary body the metallic foreign bodies excite only a slight, transient reaction, and were spontaneously extruded in most cases. No case of panophthalmitis resulted. The foreign bodies became encapsulated in half of the cases, especially in the anterior chamber and iris, which was favored among other things by the oxidizability of the metal. In none of the experiments with iron, steel, and copper was a siderosis or a diffusion of copper seen, even after six months of observation. Neither did sympathetic ophthalmia occur.

CAUSÉ.

WERNICKE (25, **Neurorecidive after salvarsan**) reports ten cases of this nature. The clinical course of each showed clearly that it was a case of syphilitic recurrence. Wernicke is convinced that this occurrence is favored by salvarsan and does not happen nearly as often under mercurial treatment. Hence he recommends that salvarsan, of the specific efficacy of which he has no doubt, should not take the place of mercury and iodide, but should be used only as a last resort.

DESNEUX (17, **Case of neurorecidive**) observed a partial paresis of the oculomotorius two months after the injection of

0.4 salvarsan in a patient who had been infected with syphilis four weeks before, which he ascribed to the neosalvarsan.

LEVIS (20, **An eye lesion following two intravenous injections of salvarsan**) administered salvarsan twice to his patient, who two months later developed a retinitis with vision recorded as $\frac{3}{100}$. Seven more injections were given in spite of the presence of the eye lesion, and the vision returned to $\frac{15}{20}$. No description of the appearance of the fundus is recorded. ALLING.

DE SCHWEINITZ (16, **Treatment of various forms of ocular syphilis with salvarsan**) regards non-inflammatory optic atrophy as a counterindication, but thinks that the treatment is indicated in specific optic neuritis. His experience has been contrary to that of some who do not believe it to be beneficial in syphilitic interstitial keratitis. The use of salvarsan he has found disappointing in palsies of the ocular muscles.

ALLING.

MAYOU (21, **Serum and vaccine therapy in connection with diseases of the eye**) gives a very complete exposition of the history and development of our present knowledge of this method of treatment. His experience has extended over six years. He formerly made use of the opsonic index in grading the dosage, but later found that the eye reactions gave an accurate indication of the dose required. Most of the original investigations have been carried on with tuberculin and staphylococcal injections in the form of vaccines. The ophthalmic diseases treated and his conclusions are as follows: In all cases of styes the injections, generally staphylococcic vaccines, were successful, especially when they were autogenous,—that is, recurrences were prevented. In chalazion the method was not so satisfactory. In streptococcal infections the treatment must be instituted early and the polyvalent serum was most useful. From his limited experience with gonococcal serum he concludes that this treatment is not superior to the ordinary nitrate of silver method. The treatment of trachoma by the injection of the sterilized conjunctival discharge was without result. He found jequiritol, however, of value, especially in recent cases with pannus. He relates four cases of scleritis which were treated satisfactorily with tuberculin. In 30 cases of chronic non-infected uveitis of

endogenous origin he found 15 tuberculous, 10 staphylococcal, and 5 syphilitic. In tuberculosis, when the patient has no extensive lesion elsewhere, $\frac{1}{1000}$*mg* of tuberculin, T. R., is administered at first, and this is gradually increased to $\frac{1}{250}$ *mg*. His results were highly satisfactory. The staphylococcic infections were treated by mixed, as well as by autogenous vaccines, the latter being the more efficient.

ALLING.

ROHMER (22, **Autoserumtherapy in ophthalmology**) reports remarkable results obtained with autoserumtherapy in diseases of the eye. To obtain the serum he applied a blister 4 or 5*cm* large on the arm of the patient, and the next morning drew off the serum and injected it beneath the conjunctiva. From 1 to 4*ccm* of the serum were injected from one to four times, according to the severity of the attack. This treatment worked particularly well in suppurative processes. The effect is also praised in non-syphilitic interstitial keratitis, in which all other forms of treatment may be abandoned.

CAUSÉ.

BOCK (15, **Treatment of scrofulous and tuberculous diseases of the eye with immune bodies**) treated 34 scrofulous and 19 tuberculous diseases of the eye, 44 with good results, 9 with no effect. The specific action of the preparation used (Spengler's) is shown by the disappearance of tuberculous nodes in the iris, the influence exerted upon tuberculous diseases in other parts of the body, and also by a series of disturbances set up by the remedy, such as ciliary injection of the previously healthy eye, great increase of precipitates, fresh iritis, and occasionally elevations of temperature, which never left permanent trouble when they passed away. With regard to the curative effect Bock obtained a favorable impression. As a rule, the photophobia of the diseased eye diminished rapidly as did the ciliary injection, exudates broke down, precipitates were absorbed more rapidly, the vitreous cleared up quickly, and nodes in the iris occasionally disappeared quickly and left no traces. He concludes that the inunction of immune bodies is a harmless remedy, which in many cases is a valuable acquisition in the treatment of scrofulous and tuberculous diseases of the eye.

SUKER (24, **Use of conjunctival flap in perforating wounds of**

the eyeball) thinks that the Kuhnt flap is useful in corneal fistulæ, corneal ulcers, corneal and scleral staphylomata, prolapse of the contents of the eyeball, hernia of the iris, extensive conical cornea, wounds, and as a protection to the cornea in conditions similar to gonorrheal ophthalmia, where perforation is liable to happen. ALLING.

IV.—METHODS OF RESERACH, REMEDIES, INSTRUMENTS, AND GENERAL OPERATIVE TECHNIQUE.

26. BEST. **Technique of cataract operation.** *Med. Klin.*, No. 15, p. 606.

27. GALEZOWSKI. **Disinfection of test lenses.** *Ann. d'ocul.*, cxlix., p. 458.

28. HALLAUER. **New spectacle glass.** *Zeitsch. f. ophthalm. Optik*, No. 1, p. 3.

29. VERHOEFF, F. H. **Some simple attachments for electric hand lamps.** *Ophthalmic Record*, June, 1913.

HALLAUER (28, **New spectacle glass**) has devised a glass that enables the rays of light which enter the eye obliquely to focus together with the principal rays, and is of especial practical value when fitting aphakic eyes.

VERHOEFF (29, **Some simple attachments for electric hand lamps**) slips the rubber bulb from an eye dropper, with the rounded end cut off, on to the ordinary pocket lamp or the De Zeng ophthalmoscope, thus obtaining concentration of the light for transillumination. A small lens may be inserted in the bulb. ALLING.

GALEZOWSKI (27, **Disinfection of test lenses**) places the lenses after each use in a dish filled with ethyl alcohol and chloroform, allows them to lie there for a few seconds, removes them with forceps, and places them on a piece of sterile gauze, when they are again ready for use. CAUSÉ.

BEST (26, **Technique of cataract operation**) has used of late a broad specially constructed keratome, and finds the healing of the wound to be quicker and astigmatism to be rarer than after the use of a Graefe knife. He considers the conjunctival flap to be of no importance as a protection against infection.

V.—ANATOMY, EMBRYOLOGY, MALFORMATIONS.

30. BERGMEISTER, RUDOLF. **A contribution to the genesis of orbital cysts, and of the anomalies found in the retina and chorioid in microphthalmos.** *Arch. f. Ophthalmologie*, 1913, lxxxv., p. 1.

31. DRUAULT. **Growth of the capsule of the lens.** *Annal. d'oculistique*, cxlix., p. 286.

32. ELSCHNIG, A. **Anatomy of the human albinotic eye.** *Archiv f. Ophthalmologie*, 1913, lxxxiv., p. 401.

33. FUCHS, E. **Pigmentation of the normal and albinotic iris.** *Ibid.*, p. 521.

34. ROCHAT, G. F. **Disease of the secondary optic vesicle as the cause of congenital malformations of the eye.** *Nederl. Tijdschr. voor Geneesk.*, 1913, i., No. 13.

35. v. SZENT-GYOERGYI, A. **The hyaloid canal in the eye of the pig.** *Archiv f. Ophthalmologie*, lxxxv., p. 137.

ELSCHNIG (32, **Anatomy of the human albinotic eye**) found the fovea centralis entirely wanting in the albinotic eyes he examined. The pigment epithelium contained minute, bright yellowish pigment granules, but no normal fuscin. He considers that the retina of the albino remains at a lower stage of development. The poor vision and the nystagmus of albinos lead to the conclusion that, as a rule, the fovea is imperfect.

FUCHS (33, **Pigmentation of the normal and albinotic iris**) differs from Ruebel's conclusion that the permeability of the iris to light is to be ascribed wholly to a lack of pigment in the stroma of the iris, and that the retinal pigment is of no importance in this respect. He describes several types of pigmentation he has seen in the retinal pigment of the human eye, quite black and uniform, black with spaces, dark brown, etc. He is of the opinion that truly good permeability of the iris to light is always dependent on a faulty pigmentation of the retinal pigment layer, and this seems to be confirmed by the anatomical examination.

v. SZENT (35, **Hyaloid canal**) confirms the constant presence of the hyaloid canal in pigs by microscopic demonstration after the use of special methods of hardening. The canal is surrounded by a limiting membrane and filled with loose vitreous tissue. He was able to demonstrate the canal in pigs, rabbits, guinea-pigs, squirrels, cattle, and mice, but could not in amphibia. He found it present in turtles, but absent in lizards and snakes.

DRUAULT (31, **Growth of the capsule of the lens**) finds from the examination of 15 human fetuses and embryos that the growth of the capsule of the lens differs in its anterior and

posterior parts. The anterior capsule grows uniformly; at birth its central thickness is about one-half, its peripheral about one-third, that in an adult. The central part of the posterior capsule appears first, and toward the end of the fourth month has a thickness of from 2 to 4 microns, which it retains in later life, but in the periphery the beginning of the posterior capsule can first be perceived when the embryo is about 43*mm* long and then gradually thickens. From the beginning of its appearance to about the middle of the seventh month this thickening of the posterior capsule remains at a uniform distance from the equator and continuously extends farther from the posterior pole.

BERGMEISTER (30, **Orbital cysts**) describes anatomically two cases of microphthalmos with coloboma and orbital cysts. The new point is that the orbital cysts in both cases came from the cavity of the pedicle of the optic vesicle. The walls of the cysts were formed from the sheath of the optic nerve. There was a hyperplastic optic nerve trunk representing the orbital section of the nerve in the region of the cyst. The dilated cavity of the pedicle of the optic vesicle communicated with the space between the pigment epithelium and the pars optica of the eyeball.

ROCHAT (34, **Disease of the secondary optic vesicle as the cause of congenital malformations of the eye**) gives the results of the examination of an eye with three congenital malformations. (1) A membrane composed of a double layer of anterior pigment epithelium and a single layer of posterior ciliary epithelium, which joined the posterior surface of the lens with the wall of the eye by means of three tags. It represented a fold of tissue drawn out from the angle between the iris and ciliary body that resulted from a luting together of the lens and the wall of the eye in the third month of pregnancy. (2) A persistent hyaloid artery, which lay between two of the above mentioned tags without reaching the wall of the eye. This could not be the cause of the membrane formation, in accordance with the Manz–Hess theory, but rather the reverse. (3) A coloboma of the optic nerve. The entrance of the nerve consisted of a deep furrow formed from the three membranes of the eye. The pigment epithelium at the margin of the furrow was proliferated in an annular manner, thus represent-

ing the part of the eye that had been snared off. There were absolutely no signs of inflammation. The first and third of these deviations from normal could be explained only through the assumption of pathological changes in the secondary optic vesicle, such as are found in naphthalin and ergotin poisoning. Colobomata also, especially the atypical, harmonize better with such isolated degenerations of the optic vesicle than with the Manz–Hess theory. VISSER.

VI.—NUTRITION AND INTRAOCULAR TENSION.

36. TERRIEN and DANTRELLE. **Clinical and morphological study of the coagulability of the aqueous.** *Annales d'oculist.*, cxlix., p. 454.

TERRIEN and DANTRELLE (36, **Coagulability of the aqueous**) gather from their studies that the clot of aqueous always has the same form as that of blood, if the content of fibrin is the same. The coagulation of the aqueous depends on the amount of soluble calcium salts present; the vaso-dilatation of the ciliary vessels is a very important factor in permitting the passage of fibrinogen and antibodies into the aqueous, and so is the front line of defense against external injuries.

CAUSÉ.

VII.—THE SENSE OF SIGHT.

37. BAHN, O. A. **The moving picture and the eye.** *New Orleans Medical and Surgical Journal*, Oct., 1912.

38. BOSSIDY, J. C. **A case of uniocular polyopia existing in both eyes.** *Jour. A. M. A.*, Sept. 21, 1912.

39. BUEHLER. **Perceptions of form. Experimental studies for the psychological and esthetic analysis of the ideas of space and time.** Stuttgart, 1913.

40. CANTONNET. **Achromatopsia congenitalis totalis.** *Arch. d'ophtalm.*, xxxiii., p. 289.

41. MEISLING, A. **The color of the macula.** *Forhandl. i det oftalm. Selskab i Kobenhavn*, 1912.

42. VOGT. **Production of a yellow-blue light filtrate in which the macula appears yellow in the living subject, the nerve fibers of the retina and other minute details become visible, and the degree of yellowness of the lens is demonstrable with the ophthalmoscope.** *Archiv f. Ophthalm.*, lxxxiv., p. 293.

VOGT (42, **A light filtrate in which the macula appears yellow in the living subject**) has sought to solve the question as to the pigmentation of the macula lutea by means of the

ophthalmoscope with properly filtered light. The mixture of light best fitted for this purpose is composed of about equal parts of blue and of yellow rays; above all, the red rays must be filtered out. With the help of such light, containing blue, yellow, and green rays, one may perceive a yellow color of the central part of the macula in the upright image in the living eye. The extent of the area corresponds closely with that which is stained yellow *post mortem*. The condition apparently is one of a selective absorption in the pigment and blood coloring matter, rather than of a distinct color. With this light, fine details of the retina, *e. g.*, the course of the nerve fibers, also become visible. The yellowness of the lens may likewise be seen at the same time.

In order to obtain a control examination to the contradictory views concerning the color of the macula, MEISLING (41, **The color of the macula**) stained gelatine membranes on glass, shaped like the macula, with solutions of auramin and sodium bichromate of various strengths. It became evident that the conditions for observation of the yellow color were better on a white than on a red background, and were absolutely bad when the background was black, when the yellow disappeared entirely unless it was particularly intense. The same was the case when the light from a mercury lamp and a background made of a solution of blood were used. It is therefore not strange that the yellow of the macula cannot be seen with the ophthalmoscope and the mercury light, especially as the blue fluorescence of the media is annoying. White daylight is best suited for the observation of a weak yellow stain, and is superior to a source of light with spectral lines. Evidence cannot be obtained with the mercury lamp whether the macula lutea is rightly named or not. GROENHOLM.

CANTONNET (40, **Total congenital color-blindness**) examined twice within six years a man 20 years old who had total congenital color-blindness. Both eyes were hypermetropic and had a vision of $\frac{1}{3}$, with a slight horizontal nystagmus and only slight sensitiveness to light. The visual field was normal, without scotoma. Ophthalmoscopically only some unimportant anomalies could be seen—physiological excavation, tortuosity of the vessels, and medullated nerve fibers. The color sense was totally wanting; the patient could distinguish

only black and white. All colors appeared to him to be simply differences of brightness; yellow he called a bright tone, red and green middle tones, blue and violet dark. Holgren's and Parinaud's tests afforded him the greatest difficulties. The entire world seemed to him to be gray on gray, with slight variations of brightness. Cantonnet thinks that it might perhaps be possible to learn more about the nature of color-blindness if every person with congenital amblyopia had his color sense tested, as many of these are color-blind without knowing it.

CAUSÉ.

BUEHLER (39, **Perceptions of form**) describes his analytical studies of the basis of these perceptions. There are three variable factors in the impression given by a line—its straightness or curvature, its length, and its direction. For the impression of straightness he thinks that not only movements of the eye take part, but also other factors; certain elements of the retina are concerned in such a way that by their simultaneous stimulation the impression is produced of straight lines. This is indicated by the astonishing fineness of the impression. The impression of length, or size, cannot rest alone upon the number of the stimulated retinal elements; in addition to the size of the retinal image it must also depend at least on the factor of distance. In the Mueller–Lyer illusion there is no perspective, or deep factor, to be taken into account. As regards the perception of differences of size, impressions of proportion come into consideration, which are perhaps the most important factors in the perception of space and time. At any rate, proportions can be grasped extremely accurately and compared, while wholes and differences lead to many unsatisfactory results. This he proceeds to demonstrate from the observation of simple right angles. Then he deals with various experimental variations of this perception of proportion regarding space and time.

BAHN (37, **The moving picture and the eye**) found after viewing moving pictures injection of the lids, lacrymation, retinal fatigue, pains in the eyes, headaches, muscæ volitantes, and dizziness. He believes the moving picture to be a decided strain upon the eyes, especially if there is any refractive or muscular error

ALLING.

BOSSIDY's (38, **Uniocular polyopia in both eyes**) patient was a girl of 14, who had perfect vision with correction for myopic astigmatism. There was paresis of the ocular muscles, and a cycloplegic did not eliminate the diplopia. Later she said she saw four objects with each eye. It was evidently of hysterical origin. ALLING.

VIII.—ACCOMMODATION AND REFRACTION.

43. DUANE, A. **Normal values of the accommodation at all ages.** *Journal A. M. A.*, Sept. 21, 1912.

44. HALBEN. **Indications for the prescription of monocles.** *Therap. Monatschr.*, xvii., p. 189.

45. LAMBERT, W. E. **Removal of the lens in high myopia.** *Jour. A. M. A.*, Sept. 21, 1912.

46. ROELOFS, C. OTTO. **The connection between accommodation and convergence.** *Arch. f. Ophthalmologie*, lxxxv., p. 66.

47. TANGE, R. A. **A case of traumatic myopia.** *Nederl. Tijdschr. voor Geneesk.*, 1913, i., No. 19.

DUANE (43, **Normal values of the accommodation at all ages**) has continued his studies of the normal accommodation and now presents the results of the examination of 1500 cases. The mean values of accommodation at different ages are as follows:

Age 8	13.8	Age 36	7.1
" 12	13.1	" 40	5.9
" 16	12.4	" 44	4.2
" 20	11.5	" 48	2.5
" 24	10.4	" 52	1.6
" 28	9.4	" 56	1.2
" 32	8.3	" 60	1.1

ALLING.

ROELOFS (46, **Connection between accommodation and convergence**) sought (1) to determine the maximum of divergence, both the absolute and the relative, *i.e.*, the maximum of divergence that can be obtained in different conditions of accommodation; (2) to determine the relative position of rest during fixation of an object at a great distance with simultaneous accommodation secured by the interposition of concave glasses; (3) to determine the relative position of rest during fixation of an object at various distances. He found that with practice and patience the same maximum of divergence can

be reached in every condition of accommodation; inversely, that any accommodation is possible with any divergence. In monocular vision exophoria gradually becomes greater, and the connection between accommodation and convergence gradually looser. On the whole the association between these two functions is a result of practice. The idea of distance, either as the direct consequence of the sense of perception, or as a picture of memory, may be brought about both by convergence and also by the innervation of accommodation. Centripetal stimuli, the so-called feeling of convergence, may excite an innervation of accommodation. In accommodation an innervation of convergence may be induced, because experience has shown that convergence produces indistinct retinal images which are rendered clear by accommodation. In the second part of his work, Roelofs reports his studies of over 200 emmetropes and ametropes, from which he finds that exophoria is the anatomical position of rest for the eyes of almost all men. Orthophoria in emmetropes and ametropes with good binocular single vision is the consequence of well-developed associations, first between the innervations of accommodation and convergence, second between the idea of distance and the innervation of convergence. Both associations can develop only with good binocular single vision. When the binocular vision is less good, hypermetropia usually causes a higher degree of esophoria, myopia more often exophoria. The exophoria in hypermetropes is therefore due to the development of an association between accommodation and convergence. An esophoria in myopia is due to the fact that binocular vision for distance is given up on account of the bad acuteness, while it is preserved for near, through which develops an association of convergence with the perception of the retinal stimulations.

LAMBERT (45, **Removal of the lens in high myopia**) has operated upon nine eyes with uniformly good results. The extremes in ages were 16 and 50. He does not consider advanced age as a contra-indication. He advocates needling followed by a linear extraction in young persons, but over 50 a preliminary iridectomy should be done before extraction. If no active inflammatory processes are going on he does not regard fundus changes as prohibitive, and thinks that retinal

detachment is not likely to occur as the direct result of the operation. ALLING.

TANGE (47, **Traumatic myopia**) reports a case of hysterical, monolateral traumatic myopia from spasm of the accommodation after an accident in shooting. The diagnosis was confirmed by hysterical symptoms in both the eye and the body. The degree of myopia fluctuated from 4 to 7 D. There were no pupillary disturbances. The vision was normal with correction. No permanent cure was obtained after a prolonged use of atropine. VISSER.

HALBEN (44, **Monocles**) warmly advocates the prescription of monocles, not only when the error of refraction is unilateral, but even when it is bilateral, because the uncorrected eye possesses sufficient visual acuteness to guarantee perception of depth. The advantages of a monocle over eyeglasses are cheapness, convenience, handiness, durability, and simplicity.

IX.—THE MOTOR APPARATUS OF THE EYE.

48. COPPEZ. **Nystagmus.** *Annal. d'oculistique*, cxlix., p. 378.

49. HOWE, L. **Measurement of fatigue of the ocular muscles.** *Journal A. M. A.*, Sept. 21, 1912.

50. MAJEWSKI. **An exceptional form of nystagmus.** *Ann. d'ocul.*, clxix., p. 389.

51. MUSZYNSKI. **A case of retrobulbar neuritis with oculomotor paresis.** *Wiener ophthalm. Gesellsch.*, June, 1913.

52. SNELLEN. **The cause of concomitant convergent strabismus.** *Arch. f. Ophthalmologie*, lxxxiv., p. 433.

HOWE (49, **Measurement of fatigue of the ocular muscles**) uses a pair of revolving Crété prisms by means of which any prism strength may be obtained by pushing up a pointer on the handle of the instrument. The elevation of the pointer is recorded on a revolving drum. The subject is requested to state when the images appear double, and then the pointer is immediately dropped to zero. He thus produces tracings showing endurance of muscle convergence and divergence and the development of fatigue. He calls the instrument an ophthalmic ergograph, and thinks it will open a new field in ophthalmology. ALLING.

COPPEZ (48, **Nystagmus**) says that in general vestibular nystagmus is a physiological phenomenon, consisting of a slow and a rapid phase, of which the former is the primary and

fundamental, caused by a stimulation of the vestibular apparatus, which starts from the vestibular nucleus and passes over to the oculomotor nucleus through the longitudinal and vestibulo-mesencephalic bundles. Probably there are special centers for the tone and rhythm of the movements of the eyes, which together regulate the balance of the eye muscles. Optical, or railroad nystagmus is likewise a physiological phenomenon. He also deals with nystagmus caused by affections of the nervous system, nystagmus from amblyopia, and miners' nystagmus. The last he thinks a peripheral muscular weariness which may gradually become central and nuclear.

CAUSÉ.

MAJEWSKI (50, **Exceptional form of nystagmus**) observed a peculiar form of nystagmus in a student 25 years old, who had a healthy nervous system and normal conditions of the eyes. At certain moments a very rapid oscillatory horizontal nystagmus appeared, which ceased when he looked to the side or upward. It was shown by the photographic method that the vibrations lasted from $\frac{1}{3}$ to $\frac{3}{4}$ of a second, and that each vibration was composed of from 10 to 20 twitchings. The oscillations were 1500 to the minute, instead of 300 as is usual. During the nystagmus all objects seemed to the patient to move. The vibrations appeared more frequently when the eyes were converged. The nystagmogram showed that the affection was not one of the convergence tonus, but of the associated lateral movements. The cause could not be determined.

CAUSÉ.

MUSZYNSKI (51, **Retrobulbar neuritis with oculomotor paresis**) reports the case of a woman 30 years old who had a retrobulbar neuritis and an oculomotor paresis. She had had an attack of influenza fourteen days before, and since that time had had pains in the right side of her face. The right eyeball was elevated, the right pupil contracted and reacted slowly to light. The eyeball was painful to pressure and to movement. Although the fundus was normal, vision was reduced to fingers at 1*m*. The accessory sinuses were normal. The sensitiveness of the right side of the face was subnormal. There was a slight periostitis on the right side of the hard palate. Nine days later there was a paresis of the extrinsic muscles of the eye. The consensual reaction of the pupil was good. There was a slight

enophthalmos, a slight paresis of the right facial nerve, and the hearing of the right ear was diminished. Wassermann and von Pirquet were negative. The writer could give no explanation of the case, but suggests that it is similar to the two cases described by Fuchs, in which an arachnoidal fold and an inflammation of the arachnoid caused an external ophthalmoplegia. TERTSCH.

SNELLEN (52, **Cause of concomitant convergent strabismus**) believes that this form of strabismus is caused by a paresis or insufficiency of one or both externi with subsequent increased tension of the interni. When there is good vision of both eyes and the angle of strabismus is small, the power of fusion compels the strabismus to be either latent or periodic. Hypermetropia alone, without paresis of the abducens, produces no strabismus, even when the eye is amblyopic. There is no amblyopia ex anopsia. The amblyopia met with in strabismus depends upon a partial atrophy of the retina or of the optic nerve.

X.—LIDS.

53. HEILBRUN. **A contribution to the etiology of herpes zoster ophthalmicus.** *Klin. Monatsbl. f. Augenheilkunde*, April, 1913, p. 516.

54. LANDRIEU. **Two cases of ocular trichophyton.** *Annales d'oculist.*, cxlix., p. 455.

55. SUNDE, A. **Herpes zoster frontalis with the bacterial findings in the Gasserian ganglion.** *Deutsche med. Wochenschrift*, No. 18, p. 849.

56. VILLARD. **Surgical treatment of senile entropion of the lower lid by Terson's operation.** *Annales d'oculistique*, cxlix., p. 321.

57. WAETZOLD. **Molluscum contagiosum.** *Berl. ophthalm. Gesellsch.*, June, 1913.

HEILBRUN (53, **Etiology of herpes zoster**) reports a case of herpes zoster ophthalmicus with paresis of the first branch of the trigeminus, oculomotorius, abducens, and trochlearis, a superficial and deep keratitis and iridocyclitis, as well as the eruption on the skin. Treatment with tuberculin was instituted and, in the opinion of the writer, effected a cure. No local reaction was observed. A possible tuberculous etiology should be taken into account in the future when we have to deal with very severe cases of herpes zoster ophthalmicus.

SUNDE (55, **Herpes zoster frontalis with bacterial findings**

in the Gasserian ganglion) examined the Gasserian ganglion of a patient who died three and a half days after an outbreak of herpes zoster. The ganglion was considerably swollen and contained distinct hemorrhages, especially in its anterior portion at the place where the first branch of the trigeminus is given off. Microscopically the picture was presented of an acute inflammation with numerous small hemorrhages, hyperemia, and round-cell infiltration, particularly in the capsule and about the ganglion cells; in addition a quantity of Gram-positive cocci were found in all sections, usually arranged as diplococci, or in chains.

LANDRIEU (54, **Ocular trichophyton**) adds two new cases of trichophyton infection of the lids to the fifteen already on record. He distinguishes two forms of the disease: in one it resembles herpes and only secondarily attacks the cilia and eyebrows; in the other the margins of the lids alone are involved. The infection is usually of animal origin.

CAUSÉ.

WAETZOLD (57, **Molluscum contagiosum**) found in fresh, young portions of molluscum contagiosum cell forms that were very suspiciously like protozoa. ADAM.

VILLARD (56, **Surgical treatment of senile entropion**) prefers the operation brought forward by A. Terson in cases of senile entropion. The conjunctiva is first excised, protecting the margin of the lid and the lower transition fold. A piece of skin in the form of an equilateral triangle with its apex directed toward the temple and its base about *2mm* from the outer canthus is then excised and the defect closed with four or five sutures. The defect in the conjunctiva is not sutured. The immediate corresponds almost exactly with the final effect. Healing is usually complete within a week. He has operated in this manner in twenty-five cases; fifteen of the operations on ten patients date back from one to eight years. In all, the result has been perfect and there has been no recurrence.

CAUSÉ.

XI.—LACRYMAL ORGANS.

58. BRUNSLOW. **Contribution to the etiology of the chronic diseases of the lacrymal passages.** *Zeitschr. f. Augenheilk.*, xxix., 5, p. 445.

59. FUCHS. **Synergic action between the nucleus facialis and the nucleus salivatorius.** *Ophthalm. Ges. Wien.*, June 2, 1913.

60. Reuter. **Dacryocystorhinostomy.** *Inaug. Diss.*, Bonn.
61. Tooke, F. **Polypoidal formation in the lacrymal sac.** *Trans. Amer. Ophthalm. Society*, 1912.

Fuchs's (59, **Synergic action between the nucleus facialis and the nucleus salivatorius**) patient had a bilateral facial paresis, a defect of psychical weeping and of the reflex secretion of tears; tears came only during eating and drinking, and particularly when laughing, more from the left than the right eye. Objectively the eyes were normal, except for a blepharitis, and there was no obstruction to the lacrymal flow. He had also a disturbance of hearing—the acuteness of hearing was reduced especially for high notes, more on the left than on the right side. The lacrymal secretion resulted normally as a cortical reflex from the trigeminus and optic nerve. Goldzieher has shown that psychical weeping disappears when the cause of a facial paresis has a high seat. In this case there was a transmission of the strong stimulation of the facial nucleus to the nucleus salivatorius, lying in front and to the medial side of it. Tertsch.

Brunslow (58, **Etiology of chronic diseases of the lacrymal pasages**) found in 63 cases of dacryocystitis positive disease of all of the accessory sinuses in 3, of the frontal sinus, the antrum of Highmore, and of the ethmoid in 3, of the antrum and ethmoid in 3, of the ethmoid with suspected trouble in the antrum in 18, and of the ethmoid alone in 13; disease of the accessory sinuses was therefore positively present in 63.5% of his cases. Suspected accessory sinus disease existed in 14, endonasal troubles of some other kind were present in 7, and in only 2 could none of these pathological conditions be found.

Tooke (61, **Polypoidal formation in the lacrymal sac**) in a series of fifty cases of extirpation of the lacrymal sac found two with definite polypoidal formation. In neither case had there been purulent discharge, nor had the canaliculi been slit or probed. The polypi were pedunculated and situated in the neighborhood of the nasal duct.

Alling.

Reuter (60, **Dacryocystorhinostomy**) describes briefly the normal and pathological conditions of the parts under consideration. Then the etiological factors productive of disease

of the lacrymal sac or canal are grouped; these are by far most commonly diseases of the nose, less often diseases of the accessory sinuses. He himself has been able to find no demonstrable lesion in the nose or accessory sinuses in only five out of thirty-three cases of dacryocystitis. As regards treatment, probing should be considered only in the first stages of the lacrymal trouble, but the removal of the sac is indicated, especially in the working classes, because of the danger to the eye from the suppuration. Finally he gives the clinical histories of twelve cases in which Toti's operation was performed with excellent results. In 66% the suppuration ceased and a communication with the nose was formed that performed its function well, yet the final result is uncertain. Previously probed cases gave the worst prognosis as regards the success of the operation.

XII.—ORBITS, INCLUDING EXOPHTHALMOS, ACCESSORY SINUSES.

62. CHEVALLEREAU and OFFRET. **Exophthalmos from interstitial myositis.** *Annales d'oculistique*, cxlix., p. 398.

63. COULOMB. **Introduction of a glass ball in the capsule of Tenon.** *Ibid.*, p. 456.

64. GABRIELIDES. **Orbito-temporal hydatid cyst.** *Korrespondenzbl. f. Schw. Aerzte.*, No. 13.

65. GORDINIER, H. C. **Exophthalmos a common symptom of chronic Bright's disease.** *Archives of Diagnosis*, April, 1912.

66. GRUENING, E. **Idiopathic hematoma of the orbit.** *Trans. Amer. Ophthalm. Society*, 1912.

67. KNAPP, A. **The Kroenlein operation as an exploratory procedure in affections of the orbit.** *Jour. A. M. A.*, Sept. 21, 1912.

68. POSEY, W. C. **Orbital cellulitis from disease of the superior maxilla in children.** *Ibid.*, Sept. 21, 1912.

69. POSEY, W. C. **Small round-celled myosarcoma of orbit with extension into the eyeball.** *Penn. Med. Jour.*, April, 1912.

70. WEBSTER, DAVID. **A case of sarcoma of the orbit.** *Medical Record*, Aug. 17, 1913.

71. WEEKERS. **Oculo-sympathetic syndrome.** *Le Scalpel*, May 18, 1913.

72. WEEKS, J. E. **A case of endothelial sarcoma of the orbit.** *Trans. American Ophthalmological Society*, 1912.

73. WEEKS, J. E. **Some cases illustrating ocular disturbances due to disease of the nose and accessory sinuses.** *N. Y. State Jour. of Med.* Oct., 1912.

74. WYLER, J. S. **Enucleation under ciliary ganglion anesthesia.** *Ophthalmic Record*, June, 1913.

75. ZENTMAYER, W. **A case of plexiform neurofibroma involving the orbit.** *Trans. Amer. Ophthalm. Society*, 1912.

WYLER (74, **Enucleation under ciliary ganglion anesthesia**) reports the use of the Elschnig method of anesthesia in three cases with satisfactory results. A solution of 1% cocaine and 1:10,000 adrenalin is injected by entering the needle at the angle of the external canthus and penetrating 5*mm*. None of these patients saw flashes of light when the nerve was cut, an observation that bears on a mooted question.

ALLING.

WEEKERS (71, **Oculo-sympathetic syndrome**) pictures the symptoms of paresis of the sympathetic, ptosis and meiosis, together with more rarely enophthalmos, hypotension, lessened secretion of tears, and vasodilatation of the vessels of the same side of the face, and of irritation of the sympathetic, widening of the palpebral fissure, mydriasis, and exophthalmos. Then he enumerates the various affections in which such disturbances may occur. First are those in which the lesion affects the nervous centers, or the nerves at their places of origin, such as inflammatory diseases of the spinal cord, compressions, cerebrospinal syphilis, tabes, multiple sclerosis, and syringomyelia. Second are those in which the nerves are irritated or destroyed somewhere along their courses, as by tumors of the lungs or esophagus, tuberculous or carcinomatous glands, aneurysms of the aorta, other affections of the bronchi, lungs, and pleura, traumatisms to the thorax or brachial plexus, herpes zoster, diseases of the thyroid, pharynx, or larynx, aneurysms of the carotid, lesions of the ciliary ganglion, diseases of the bony skull. He reports three cases in which affections of the sympathetic complicated syphilis, exophthalmic goiter, and pulmonary tuberculosis.

DANIS.

POSEY (68, **Orbital cellulitis from disease of the superior maxilla in children**) relates two cases showing abscess formation in the lids and cheeks in children one and two years of age. Both cases proved to be osteomyelitis of the superior maxilla. In neither case was there history of traumatism, or any evidence of sinus or nasal trouble. A previous general infection had taken place, to which the condition was considered second-

ary. He points out that in infancy the cancellous structure of the bone largely predominates, rendering it especially liable to inflammatory processes. ALLING.

CHEVALLEREAU and OFFRET (62, **Exophthalmos from interstitial myositis**) report a great exophthalmos from interstitial inflammation of the muscles in a drinking man 54 years of age, who had formerly complained of an inequality of the pupils, the left being meiotic, and of a lichen urticans. The exophthalmos with edema of the lids and paresis of several muscles was quite suggestive of a retrobulbar tumor. Kroenlein's operation revealed trouble with the superior and internal recti, pieces of which were excised and proved microscopically to be inflamed muscle tissue. The exophthalmos became so great as to cause keratitis neuroparalytica, and the orbit was exenterated. No tumor was present, but there was only a hypertrophy of the muscles characterized by numerous inflammatory nodes and an intense sclerosis. Although Wassermann's test was negative, syphilis was thought to be the probable cause.

CAUSÉ.

GABRIELIDES (64, **Orbito-temporal hydatid cyst**) reports two cases of hydatid cyst of the orbit. The first patient was a woman 65 years old, who presented symptoms of echinococcus disease of the liver and developed a cyst in the upper-outer part of the temporal bone after a blow that injured the bones of the orbit. This cyst had developed toward the orbit and produced a considerable degree of exophthalmos, and had also grown toward the temple, forming another cyst which communicated with the one in the orbit. Fluctuation could be felt distinctly, the pains were typical, and eosinophilia was well marked. The characteristic anaphylactic symptoms appeared immediately after puncture. Both cysts were removed by operation, the orbital through an incision in the upper lid. The second patient was a young woman 20 years old in whom the disease had developed in the course of ten years. There was enormous exophthalmos, distinct fluctuation, 7% eosinophilia. Still more severe anaphylactic symptoms than in the first case followed puncture. The cyst was removed by operation. Two important general symptoms of the disease are the eosinophilia, shown by examination of the blood, and the presence of specific antibodies in the serum, shown by the

complement deviation, Weinberg's reaction. Human echinococcus fluid a year old was used as antigen. The Weinberg was positive in both cases. The puncture of the cyst for the purpose of examination of the fluid is not to be done without hesitation on account of the anaphylaxis, which may give threatening symptoms; it is best to do it just before the operation. The only condition from which such a cyst needs to be differentiated is a meningocele of the orbit, and in this also puncture is inadvisable; when a meningocele is suspected no puncture should be made unless a lumbar puncture is done at the same time. A soft sarcoma, a lipoma, dermoid, angioma, or an encapsulated abscess may be excluded easily by examination of the fluid removed. Cerebrospinal fluid contains globulin, which is quite absent in echinococcus fluid, while sodium chloride is very abundant in the latter and almost completely absent in the former. The differentiation may be made very quickly with the aid of the microscopic examination, as the normal fluid contains almost no cellular constituents, while hooks, scolices, or bits of membrane may be demonstrated in the centrifuged fluid from a hydatid cyst. The radical operation should be performed under ether, as this contributes to the lessening of the anaphylactic shock.

GRUENING (66, **Idiopathic hematoma of the orbit**) saw a girl of 17 with exophthalmos of the right eye amounting to 15*mm*, who gave the history that it appeared after an attack of severe pain in the eye accompanied by vomiting. The conjunctiva below the cornea was enormously swollen and overlapped the lower lid. The ophthalmoscope showed choked disk. The Kroenlein operation disclosed a sac filled with fluid blood, which was evacuated. The exophthalmos and optic neuritis disappeared. ALLING.

WEEKS (72, **Endothelial sarcoma of the orbit**) by means of the Kroenlein operation discovered a small tumor 10*mm* by 12*mm* in the apex of the orbit. The considerable amount of exophthalmos present was explained as being due to obstructed circulation. The tumor had developed during eight years, the first symptom being blurring of the vision following a severe blow. ALLING.

WEBSTER'S (70, **Sarcoma of the orbit**) case was a man 34 years old who noticed a tumor above and below the inner

canthus. It extended into the orbit and was entirely removed by the method of Kroenlein, proving to be a round-celled sarcoma. After two and a half years there had been no recurrence. ALLING.

POSEY (69, **Myosarcoma of orbit**) found a tumor mass in the orbit by means of the Kroenlein operation. Thinking that it was malignant the eye was removed and a dense mass of non-pigmented spindle cells was found involving an area of the chorioid and following the course of the vortex veins through the eyeball. The tumor apparently originated as an endothelial sarcoma of the orbit, and slowly followed the blood-vessels. It did not seem reasonable that the interior of the eye should have remained so free from involvement if the point of origin had been there. ALLING.

KNAPP (67, **The Kroenlein operation as an exploratory procedure**) calls attention to the advantages of this operation in diagnosis in morbid conditions of the orbit. The cutaneous incision should be slightly to the outer edge of the periosteal and bony wound. The periosteum is then carefully raised with a sharp flat elevator and the bony wedge elevated without sacrifice of the orbital margin so that it may be firmly wedged later to keep it well in place. It is advisable to suture the eyelids as chemosis is likely to follow the operation. Two cases are recorded. The operation, in a patient who gave the history of an orbital tumor of one year duration, disclosed a diffuse growth on the outer side and below the eyeball extending to the apex of the orbit. Being too extensive to eradicate by this method the whole orbital contents were removed later. The tumor consisted of fibrous tissue with hypertrophy of epithelial-like cells. The other case was one in which a plexiform neuroma of the eyelid had been removed seven years before. An oval tumor was discovered at the apex of the orbit and enucleated entire. It was a fibroneuroma.

ALLING.

ZENTMAYER (75, **Plexiform neurofibroma involving the orbit**) found a hemispherical mass in the left temporal region with an extension to the orbit above the eyeball and along the roof of the orbit to the apex. It was composed of medullated and non-medullated nerve-fibers in a mass of fat and connective tissue. ALLING.

Some of WEEKS's (73, **Ocular disturbances due to disease of the nose and accessory sinuses**) cases are as follows: Case of reflex neurosis affecting upper branch of the fifth and branches of the third supplying the sphincter of the iris and the ciliary muscle from a furuncle on the inner aspect of the ala of the nose. Neurosis with ciliary spasm and cephalalgia induced by pressure of hypertrophied turbinate. Edema of the orbit and interference with motility as result of disease of the orbital ethmoid cells. Monocular retrobulbar neuritis from disease of the posterior ethmoid and sphenoid sinuses. Marked exudative neuroretinitis from non-suppurative but septic process in the posterior ethmoid and sphenoid cells with deviation of the septum. ALLING.

Out of twenty-eight cases of chronic nephritis studied by GORDINIER (65, **Exophthalmos a common symptom of chronic Bright's disease**), fourteen presented exophthalmos of varying degrees, associated with one or more of the accompanying ocular conditions such as von Graefe, Stellwag, or Moebius symptoms. He believes that the most probable explanation for these symptoms is an irritation of the cervical sympathetic system by toxins floating in the blood stream as the result of renal insufficiency. ALLING.

COULOMB (63, **Glass ball in Tenon's capsule**) reports the case of a patient on whom Frost's operation was done at the age of 3, and who is now 16. The glass ball has been borne well, the artificial eye has almost exactly the same position as the natural one, which is more important than the excursions of its movements. CAUSÉ.

XIII.—CONJUNCTIVA.

76. BAYER. **Combination of vernal catarrh with trachoma.** *Klin. Monatsbl. f. Augenheilkunde*, May, 1913.

77. BRUNS, H. D. **Phlyctenular ophthalmia and its etiology.** *Jour. A. M. A.*, Sept. 21, 1912.

78. GIRI. **Contact infection in carcinoma of the eye.** *The Ophthalmoscope*, 1913, p. 202.

79. GRANDCLEMENT. **Cure of a large epibulbar epithelioma by the use of the X-rays and of radium.** *La clinique ophtalm.*, xix., p. 313.

80. KIRKENDALL, J. S. **Parinaud's conjunctivitis.** *Med. Record*, Nov. 12, 1912.

81. KOMOTO. **An operation for argyrosis of the scleral conjunctiva.** *Zentrabl. f. prakt. Augenheilkunde*, May, 1913.

82. MEYERHOF. **Trachoma immunity.** *Ibid.*, June, 1913.
83. NICOLLE, CUÉNOD, and BLAIZOT. **Experimental studies of trachoma.** *Annales d'oculistique*, cxlix., p. 401.
84. WEIDLER, W. B. **Pemphigus of the conjunctiva.** *Jour. A. M. A.*, Sept. 21, 1912.

KIRKENDALL'S (80, **Parinaud's conjunctivitis**) case was that of a farmer who had been treating his horses and cows for the "distemper" associated with "pink eye," confirming the theory that Parinaud's conjunctivitis arises from contagion derived from animals. Bacteriological examination showed only staphylococcus albus and aureus. ALLING.

NICOLLE, CUÉNOD, and BLAIZOT (83, **Experimental studies of trachoma**) seem to have succeeded in inoculating the macacus with trachoma by superficially excoriating the conjunctiva and then placing the virus upon it. After an incubation period of a week the conjunctiva becomes red, the typical granulations appear at the end of two weeks, the infection then spreads, and in about four weeks the typical aspect of trachoma is presented after which the process slowly retrogrades until by the end of three months it has disappeared without leaving any traces. They ascertained that the invisible agent of trachoma is a filterable microbe, and that the tears of patients with trachoma are infectious even to the intact conjunctiva. The trachoma virus is destroyed by heating to 50° for thirty minutes, and can be preserved in glycerine for at least a week. A successful inoculation seems to render the animal immune to a new infection. Encouraging experiments were undertaken to immunize through both the intravenous and the subconjunctival introduction of the trachoma virus, which had happy results even in man. The authors recommend the subconjunctival method.

CAUSÉ.

MEYERHOF (82, **Trachoma immunity**) reports a case of severe trachoma that had existed in one eye only for three and a half years, and was finally treated by the combined excision. Five days after the operation a catarrhal conjunctivitis suddenly broke out in the hitherto healthy eye, and the Halberstaedter–Prowazek bodies were demonstrable in the secretion. The further course of the disease proved it to be a typical case of trachoma infection.

BAYER (76, **Vernal catarrh with trachoma**) reports a case of this nature in which the diagnosis was very difficult. Repeated examination of the blood revealed a constant eosinophilia, and the suspected diagnosis was confirmed by the microscopical examination of the blood. Trachoma follicles and papillary elevations were present which were suggestive throughout of the picture of vernal catarrh. The left eye was enucleated because of a large leucoma adhærens which developed into a staphyloma. Beneath Bowman's membrane was a thick pannus that left only the center of the cornea free.

BRUNS (77, **Phlyctenular ophthalmia and its etiology**) states that this affection is very common among the negro race and may appear later in life than in the white race. He does not regard the disease as tuberculous or eczematous, but rather as a neuropathic manifestation brought about by auto-intoxication caused by derangement in gastro-intestinal functions. A scrofulous diathesis and poor nutrition are the predisposing causes. ALLING.

WEIDLER (84, **Pemphigus of the conjunctiva**) tells of a Russian aged 70, who gave a history of failing vision for six months. In the right eye the iris was brown and the pupil sluggish. The lids were thickened and there was total symblepharon, the palpebral fissure being about 8*mm* wide, and the cornea covered with a thick membrane. The left eye was similarly affected to a lesser degree. Spots of necrosis developed in the conjunctiva and there was ulceration of the cornea. The disease also affected the mucous membrane of the nose. ALLING.

GRANDCLEMENT (79, **Cure of epithelioma**) observed in a woman 60 years old an epibulbar epithelioma which extended from the caruncle over the surface of the eye to the center of the cornea. X-ray treatment was instituted immediately, with the result that at the end of a month the tumor had completely disappeared, except for a superficial redness at one place. Toward the middle of the treatment the rays had to be discontinued for a short time on account of a superficial erosion of the cornea, which healed quickly. A slight recurrence a month later quickly disappeared after a couple of treatments with radium. CAUSÉ.

GIRI (78, **Contact infection in carcinoma of the eye**) reports first a case of epibulbar carcinoma which gave rise after a long time to a contact tumor of the lower lid. Second, a tumor of the upper lid which gave rise to a contact tumor of the lower lid, and each of these to contact tumors of the cornea, one in the upper, the other in the lower third.

GILBERT.

KOMOTO (81, **Operation for argyrosis**) dissects away the bulbar conjunctiva that is argyrotic in the region of the palpebral fissure, and replaces it with a graft of conjunctiva taken from an eye that has been enucleated, or from the eye of a cadaver.

XIV.—CORNEA AND SCLERA.

85. CHANCE, BURTON. **Concerning two cases of dermoid at the sclero-corneal margin.** *Annals of Ophthalmology*, April, 1913.

86. CANTONNET. **Hematic infiltration of the cornea.** *Annales d'ocul.*, cxlix., p. 289.

87. FAGE. **Recurrences in interstitial keratitis.** *Ibid.*, p. 456.

88. NELSON, R. M. **Sarcoma of the sclera.** *Jour. A. M. A.*, June 7, 1913.

89. PUSCARIN. **Two observations of nodular opacities of the cornea (Groenouw's disease).** *Arch. d'ophtalm.*, xxxiii., p. 362.

90. ROY, D. **Report of six cases of degeneration of the cornea in the same family (nodular keratitis).** *Trans. Amer. Ophthalm. Society*, 1912.

91. SPRATT, C. N. **Treatment of scleritis by tuberculin.** *Journal-Lancet*, Minn., June, 1912.

92. STALBERG, K. **Treatment of ulcerative keratitis.** *Foerhandlingar-vid Svenska Oegenlaekarefoereningens*, May 5, 1912.

93. TOOKE, F. **Calcareous degeneration of the cornea and lens capsule.** *Trans. American Ophthalmological Society*, 1912.

94. WEIDLER, W. B. **Keratitis neuroparalytica after removal of the Gasserian ganglion.** *N. Y. State Journal of Medicine*, October, 1912.

SPRATT (91, **Treatment of scleritis by tuberculin**) treated one case of episcleritis and six of keratoscleritis with tuberculin. All of the cases gave a normal reaction with old tuberculin, a local reaction being obtained in six cases. The results were uniformly successful. ALLING.

PUSCARIN (89, **Nodular opacities of the cornea**) reports two cases of this disease met with in males of the ages of 20 and 45. Both cases exhibited the classical picture, and in both tuberculin treatment was absolutely without effect; after

the lapse of a year the conditions were unchanged. The first patient gave a strong general reaction to a test injection of *1mgr*, the other showed the physical signs of pulmonary tuberculosis. He excised a piece for pathological examination, but was unable to detect the least sign of an inflammatory change. A degenerative process was present, consisting of a swelling of the cells with granulations in their protoplasm probably of a colloid nature, and of a destruction of the corneal lamellæ. He does not believe this disease to be a primary tuberculosis of the cornea, but agrees with Fuchs that it is the consequence of a disturbance of the general nutrition, the nature of which is as yet unknown. CAUSÉ.

Among seventy cases of interstitial keratitis FAGE (87, **Recurrences in interstitial keratitis**) saw twelve recurrences, eight in both eyes, four in one alone. The interval between the first attack and the recurrence varied from six months to eight years. All of the recurrent cases had been determined to be due to hereditary syphilis at the time of the first attack. The course of the recurrence was more severe and left a worse functional result. He is inclined to ascribe the recurrences to an insufficient antisyphilitic treatment, and hopes that better results will be obtained from the use of salvarsan.

CAUSÉ.

In ulcerative keratitis STALBERG (92, **Treatment of ulcerative keratitis**) advocates the open treatment with hot baths of the eye. Blennorrhea of the lacrymal sac should be treated according to the usual rules. A purulent secretion does not form a contra-indication to cauterization of the ulcer, but it makes the prognosis worse. One should be careful in the use of atropine in the treatment of ulcus serpens, because of the increase of tension that frequently appears, the best treatment of which is paracentesis. GROENHOLM.

CANTONNET (86, **Hematic infiltration of the cornea**) reports a case in which during the course of a specific iritis a large hyphema that almost filled the anterior chamber was caused to appear by a blow on the eye. Gradually it became noticeable that the cornea had a transparent marginal zone with a central, brown-red opacity, which slowly decreased in size, but was still present six months after the accident. Other conditions present were cataract, posterior synechiæ, and total loss

of vision. The sensibility of the cornea was reduced in the periphery and entirely abolished in the center.

CAUSÉ.

The cornea in ROY'S (90, **Degeneration of the cornea in the same family**) cases showed various opaque spots which projected slightly from the surface with no inflammatory signs, and occurred in a mother and five children. The greatest number of cases which he has found reported in the same family was three. No treatment is of avail. The cases are exceedingly rare.

ALLING.

WEIDLER'S (94, **Keratitis neuroparalytica after removal of the Gasserian ganglion**) study of the comparative merits of alcohol injections and excision of the Gasserian ganglion shows that by the former method the patient is assured freedom from pain from six months to years. In over 600 cases of the alcohol treatment recorded in the paper there was only one having serious keratitis, whereas in 70 Gasserian operations keratitis followed in a considerable number and enucleation was necessary in some.

ALLING.

TOOKE (93, **Calcareous degeneration of the cornea and lens capsule**) enucleated a glaucomatous eye which had been lost as the result of inflammation following a traumatic ulceration of the cornea. The microscope showed deposits of lime salts in the superficial layers of the cornea especially over the pupillary region and at the limbus. The lens capsule was also found to be calcareous and to contain a clear fluid resembling vitreous.

ALLING.

CHANCE'S (85, **Dermoid at the sclerocorneal margin**) cases were both under observation at the same time. The first was a boy of 15 presenting a bluish white tumor at the limbus measuring 4 by 7*mm* and showing several hairs on its surface. It was composed of fibro-elastic tissue surrounded by epithelial and spindle cells. It had not increased in size since birth. The other case was a girl of 13 showing a tumor somewhat smaller than the other, but it had grown larger during the year. It was of pinkish color and had a few hairs projecting from it. It proved to be of complex structure containing fibro-elastic

tissue, epithelial cells, a layer of polymorphonuclear leucocytes, spindle connective-tissue cells, fat cells, sebaceous glands, and much pigment. The cells were undergoing active keratosis, and the tumor had undoubtedly taken on new growth.

ALLING.

NELSON (88, **Sarcoma of the sclera**) being unable to entirely remove a sarcoma of the sclera enucleated the eye. Later the cervical glands were excised although no record appears as to their malignancy. The patient was alive and well five years later.

ALLING.

XV.—IRIS AND PUPILS.

95. BRAV, AARON. **A case of gumma of the iris after the use of salvarsan.** *Ophthalmic Record*, June, 1913.

96. HEYMANN. **A successful case of iridodesis.** *Muench. med. Wochenschr.*, 1913, No. 14, p. 721.

97. MEES, R. **Alcoholic reflex immobility of the pupils.** *Ibid.*, No. 22.

98. PADERSTEIN. **Family pupillary difference.** *Berl. ophthalm. Gesellsch.*, June, 1913.

99. SUKER, G. F. **Primary melanosarcoma of iris followed by extensive metastatic melanosarcoma of the liver.** *Illinois Med. Jour.*, Oct., 1912.

HEYMANN (96, **Successful case of iridodesis**) reports a case that was operated on in 1864 for lamellar cataract of both eyes by means of iridodesis, an operation devised by Critchett in 1848, but soon abandoned because of the dangers from iritis, iridocyclitis, and sympathetic ophthalmia. The results in this case were excellent.

SUKER'S (99, **Primary melanosarcoma of the iris followed by extensive metastatic melanosarcoma of the liver**) patient was a woman of 29, who presented a small black spot on the iris after pregnancy. It was removed by iridectomy, but recurred in about two years, grew rapidly, and was excised again. A year later enucleation was performed. Six years from the original observation there was a recurrence in the socket, on account of which the orbit was completely exenterated and the sinuses cleared. Six months later a large nodule appeared in the orbit, and an exploratory incision over the liver showed it to be studded with bluish black nodules. The patient died soon afterward.

ALLING.

BRAV (95, **Gumma of the iris after the use of salvarsan**) saw a case of syphilitic iritis in a patient who had had an injection of salvarsan six weeks before. His original lesion dated back about five months. There was a small reddish growth at the margin of the iris, and synechiæ. These nodules on the iris are seen frequently in specific iritis and are not considered to be gummatous, contrary to the view of the author, since they are secondary manifestations. Under atropine and mercurial treatment the eye recovered in two weeks. He considers this an unusually rapid cure, and attributes it to the previous use of salvarsan. ALLING.

MEES (97, **Alcoholic reflex immobility of the pupils**) saw in a patient suffering from polyneuritis with the typical symptoms caused by alcohol a reflex immobility of both pupils associated with meiosis. Syphilis was excluded by a thorough examination. Complete abstinence from alcohol sufficed to cause the disappearance of the symptoms.

PADERSTEIN (98, **Family pupillary difference**) found a difference in the sizes of the pupils in all five members of one family. The difference was considerable in the mother, a daughter of 14, and another of 9, slight in the father and a daughter of 11. The reactions were intact. Aside from the father, in whom the history of syphilis could not be excluded, no pathological cause could be found, either in the history or by examination. A nephew of the mother likewise had a considerable difference in the size of his pupils. No examinations were made of the blood. The condition appeared to be one of a family congenital anomaly. ADAM.

XVI.—LENS.

100. BOURGEOIS. **Non-absorption of traumatic cataract.** *Soc. franc. d'ophtalm.*, cxlix., p. 397.

101. FERENTINOS. **To avoid the loss of vitreous during cataract extraction.** *La clinique ophtalm.*, xix., i., p. 317.

102. FRIDENBERG, P. **Preparatory capsulotomy in extraction of immature senile cataract.** *Jour. A. M. A.*, Sept. 21, 1912.

103. HOFFMANN. **Double refracting myeline in cataracts.** *Muenchener med. Wochenschrift*, 1913, No. 14, p. 741.

104. JACKSON, EDWARD. **Management of capsule in cataract extraction and afterward.** *Trans. Amer. Ophthalm. Society*, 1912.

105. MORET. **Operation for cataract with a conjunctival suture.** *La clinique ophtalm.*, xix., p. 182.

106. SIMPSON, W. L. **The intracapsular operation for cataract after the method of Prof. Stancleanu, Bucarest.** *Ophthalmic Record*, May, 1913.

107. WICHERKIEWICZ. **Traumatic expulsion of the lens from the eyeball.** *Zentralbl. f. prakt. Augenheilkunde*, xxvii., April, 1913.

The statement made by Mettenheimer in 1858 that double refracting substances were present in cataractous lenses was forgotten, but it has been confirmed by HOFFMANN (103, **Double refracting myeline in cataracts**) who found double refracting balls of myeline in all the cases of cataract that he examined. The myeline bodies could not be found in normal lenses.

MORET (105, **Operation for cataract with a conjunctival suture**) makes a large conjunctival flap and, after the operation has been completed, reunites the edges with sutures so as to secure an accurate closure of the wound and render the absolute quiet of the eye that has been operated on unnecessary. It is also a protection against loss of vitreous, as well as against secondary infection, and it accelerates the process of healing. CAUSÉ.

FRIDENBERG (102, **Preparatory capsulotomy in extraction of immature senile cataract**) relates the history of puncture of the capsule preparatory to extraction for the purpose of ripening the cataract and making the operation more simple. His experience and observations confirm him in the opinion that the procedure is likely to grow in favor. He suggests that the advantages of tearing out a portion of the anterior capsule with forceps (capsulectomy) may be combined with the preparatory capsulotomy by making the incisions with the knife needle above and below and to the nasal and temporal sides, thus making it easy to remove the central portion with the forceps at the time of extraction. ALLING.

SIMPSON (106, **Stancleanu's intracapsular operation for cataract**) calls attention to the advantages of this operation, which consists in making a large incision and iridectomy in the ordinary way, seizing the anterior capsule with a forceps without teeth, and rupturing the zonule by moving the lens from side to side and up and down. The cataract can then be expelled with much less force than in the Smith operation. If the zonule is too tough, or the capsule tears, the cataract may be extracted in the usual way. ALLING.

To avoid prolapse of the vitreous during a cataract operation, so far as it is not the fault of the operator, FERENTINOS (101, **To avoid loss of vitreous during cataract extraction**) applies a compressive bandage to try to reduce the intraocular tension. The bandage is applied during the evening before operation, and is removed on the operating table.

CAUSÉ.

After he has completed the corneal section and iridectomy JACKSON (104, **Management of capsule in cataract extraction and afterward**) introduces the knife again into the wound in the position it occupied immediately after the counter-puncture. It is then drawn out until the point is at the edge of the pupil nearest where the puncture was made, and the capsule is opened by pushing the knife forward until it passes under the iris. He believes that the method, which is like the peripheral capsulotomy of Herman Knapp, leaves a clearer pupil and less reaction than others. Statistics of fifty cases which he was able to follow for a considerable period, bear out this contention. Regarding capsulotomy after extraction, he advocates a long, curved needle entered at the limbus, and makes two incisions meeting each other at an angle. He has never seen untoward results. ALLING.

WICHERKIEWICZ (107, **Traumatic expulsion of the lens**) saw an eye from which the lens had been expelled by the horn of a cow. The man, 52 years old, had a sclerectasia, a black coloboma of the iris, and a black pupil. Vision with correction was $\frac{6}{9}$. A similar case was reported by Teale in the *British Medical Journal*, 1907, except that total aniridia was produced.

BOURGEOIS (100, **Non-absorption of traumatic cataract**) says that in many cases of traumatic cataract in young persons the cataract is not absorbed spontaneously even after several years and therefore too much time should not be allowed to elapse before intervention to remove the lenticular masses. He recommends a linear incision in the upper-outer part of the cornea and the extraction of the cataractous lens with a small, narrow spoon. CAUSÉ.

XVII.—VITREOUS.

108. SAMEH BEY. **A new method of exenteration of the eye in panophthalmitis.** *La clinique ophtalm.*, xix., p. 246.

In order to obtain a better stump SAMEH BEY (108, **New method of exenteration of the eye**) recommends that the cornea be not removed, but divided, either in its middle or its periphery, that the contents of the globe be removed through this wound, and that the wound be then closed with sutures, which may be taken out on the fifth day. He has performed the operation in this manner 475 times. The panophthalmitis was of endogenous origin in 14.31% of the cases, of ectogenous origin in 58.69%. CAUSÉ.

XVIII.—CHORIOID.

109. FEJER. **Endophthalmitis suppurativa after pneumonia.** *Zentralbl. f. prakt. Augenheilkunde*, June, 1913, p. 164.

110. LODBERG. **A case of cavernous melanosarcoma of the chorioid at the margin of the papilla with perforation of the retina.** *Annales d'ocul.*, cxlix., p. 439.

111. PLOMANN. **Demonstration of a patient with a tumor-like formation in the eye.** *Foerhandlingar vid Svenska Ogenlaekarefoerenings*, May 5, 1912.

112. WESCOTT, C. D. **Flat sarcoma of the chorioid.** *Trans. Amer. Ophthalm. Society*, 1912.

FEJER (110, **Endophthalmitis suppurativa after pneumonia**) reports a case of metastatic iridocyclitis after furunculosis, resulting in atrophy, and a similar one that followed an attack of pneumonia. No bacteriological examination could be made.

One eye of PLOMANN'S (111, **Tumor-like formation in the eye**) 23-year-old patient was enucleated on account of a neoplasm of the ciliary body, the pathological diagnosis of which was "inflammatory tissue." Soon afterward a similar lesion appeared in the other eye. He thinks that the neoplasms were of a tuberculous nature, as the patient gave both a local and a general reaction to old tuberculin.

Less than fifty cases of this form of sarcoma have been reported. WESCOTT (112, **Flat sarcoma of the chorioid**) adds two more. In both cases the tumors had extended through the eyeball into and along the side of the optic nerve. ALLING.

LODBERG (110, **Melanosarcoma of the chorioid at the margin of the papilla**) gives the clinical and pathological description of a cavernous melanosarcoma of the chorioid, which caused a sudden impairment of vision, that subsequently

improved greatly, in a woman 45 years old ten months before the eye was enucleated. The tumor completely covered the papilla and appeared to be attached to its lower margin. After enucleation it was found to be as large as a pea, of a black color, to have a base *7mm* broad and to arise from the chorioid at the inner lower margin of the papilla. The retina was not detached, but was broken through by the tumor, perhaps on account of the resistance afforded by the optic nerve fibers at this place and projected about *5mm* into the vitreous. Histologically it proved to be an alveolar melanosarcoma, which Lodberg considers of special malignancy. The pigment was found to be in spindle-shaped cells and in "free pigment cells."

XIX.—SYMPATHETIC OPHTHALMIA.

113. ALT, A. **Sympathetic chorioiditis.** *Jour. A. M. A.*, Sept. 21, 1912.

114. DEHENNE and BAILLIART. **Three cases of sympathetic ophthalmia.** *Annales d'oculistique*, cxlix., p. 395.

115. FISHER, W. A. **Migratory ophthalmia followed by recovery of useful vision.** *Ophthalmic Record*, Dec., 1912.

116. KUEMMELL. **Supplement to my work on a serum reaction in sympathetic ophthalmia.** *Archiv f. Ophthalmologie*, lxxxiv., 3, p. 440.

117. MANOLESCO. **Two cases of sympathetic ophthalmia ameliorated by salvarsan.** *La clinique ophtalm.*, xix., p. 318.

118. THOMSON, E. S. **Sympathetic optic neuritis, with report of a case.** *Jour. A. M. A.*, Sept. 21, 1912.

KUEMMELL (116, **Serum reaction in sympathetic ophthalmia**) obtained a positive reaction in only three out of nine cases of sympathetic ophthalmia, thus showing that the presence of this disease cannot be proved with certainty by means of the uveal antibodies.

DEHENNE and BAILLIART (114, **Three cases of sympathetic ophthalmia**) observed a sympathetic ophthalmia in a child after a serious injury of the region of the ciliary body. At the time of the outbreak the injured eye retained a vision of $\frac{1}{10}$, and was therefore not enucleated until after a number of recurrences had taken place. Recovery then took place quickly. They hold the view that too great haste should not be exercised in enucleating the injured eye in sympathetic ophthalmia, as cases are known in which the disease came to a standstill without such intervention. CAUSÉ.

MANOLESCO (117, **Sympathetic ophthalmia ameliorated by salvarsan**) has seen a beneficial effect of salvarsan in two cases of sympathetic ophthalmia. The first case was one of a man 45 years old, who had had an operation for cataract that gave him a vision of $\frac{2}{3}$. Three months later an iridocyclitis set in which reduced his vision to counting fingers at $2\frac{1}{2}m$. Two months later the same disease appeared in the other eye and reduced vision to fingers at $3m$. After an intramuscular injection of $0.60cg$ of salvarsan the vision improved within three months to $\frac{2}{3}$ in the right eye, and to $\frac{1}{3}$ in the left. The other case was a child 8 years old, who had wounded one eye with a knife ten months before, and had, when he came under observation, atrophy of the wounded eye and cyclitis in the other, with which he could count fingers at three meters. A rapid improvement followed an intramuscular injection of $0.3cg$ of salvarsan, so that his vision was $\frac{1}{2}$ at the end of three weeks, the exudates in the pupil were absorbed, and the posterior synechiæ reduced to two. He advises an injection of salvarsan in every case of sympathetic ophthalmia, and also as a preventive in serious wounds of the eye. CAUSÉ.

Sympathetic ophthalmia set in four weeks after an accident which destroyed the eye of a child treated by FISHER (115, **Migratory ophthalmia followed by recovery of useful vision**). The injured eye was enucleated, but the vision of the other was practically lost through filling in of the pupil and secondary glaucoma. An iridectomy, then extraction of the lens, and finally, three years later, an iridotomy resulted in recovery of $\frac{10}{10}$ vision. He emphasizes the importance of waiting for a considerable period after all inflammatory signs have subsided before attempting any operation on these eyes.

ALLING.

ALT (113, **Sympathetic chorioiditis**) presents the case of a boy of nine who lost an eye through inflammation following a wound in the sclero-corneal region. About two months later signs of sympathetic inflammation appeared in the other eye—scleral congestion, small pupil, deposits on the anterior capsule and dustlike opacities in the posterior vitreous. The papilla was congested and the retinal veins enlarged and tortuous. The eye cleared under appropriate treatment, but later there were discovered a number of chorioidal spots in the inferior

equatorial region. These the author thinks did not appear until two months after the onset of the sympathetic ophthalmia and at a time when all other signs had disappeared except the slight redness of the disk and tortuousity of the veins. These spots were round and sharp in outline, whitish or yellowish in color. During the following few weeks others appeared. Gradually the larger patches assumed a pinkish color and some of the smaller ones disappeared. The case seems to be one of the few observed in which sympathetic chorioiditis has occurred without a previous cyclitis although there was a mild iritis.

The enucleated eye showed the inflammatory signs severest in the retina, especially in the posterior parts where the chorioid was least affected. The inflammation was of the hemorrhagic and proliferating type. ALLING.

THOMSON'S (118, **Sympathetic optic neuritis**) case, a male of 32, had lost his left eye in youth from injury with a stick. The eye showed a degenerated iris and calcareous lens but was not inflamed or glaucomatous. The other eye was clear but the optic nerve was blurred and of dull white appearance similar to that of a nerve passing into post-neuritic atrophy. The vision was $\frac{10}{200}$. There was no evidence of constitutional disease and Wassermann reaction was negative. Enucleation of the blind eye was performed and the optic nerve was found reduced to a string of fibrous tissue. The nerve of the other eye cleared later and the vision improved to $\frac{20}{100}$. The field which was much contracted did not change. He thinks that the optic neuritis had been present for at least six months. He gives extracts of similar cases from literature, and points out the importance of watching cases in which there is an eye capable of exciting sympathetic disease, since the neuritis is insidious in onset. ALLING.

XX.—GLAUCOMA.

119. DOR. **Glaucomatous vertigo.** *Ann. d'ocul.*, cxlix., p. 391.

120. FOURRIÈRE. **Clinical studies concerning the use of Schioetz's tonometer.** *Ibid.*, pp. 261 and 335.

121. GALEZOWSKI. **Preglaucomatous state. Physiological and pathological excavations. Preventive treatment of glaucoma.** *Ibid.*, p. 391.

122. GRUENING, E. **The operation of combined iridectomy and sclerectomy for chronic glaucoma.** *Trans. Amer. Ophthalm. Soc.*, 1912.

123. LACOMPTE. **An extraordinary case of spontaneous intraocular hemorrhage with rupture of the eyeball.** *Arch. d'ophtalm.*, xxxiii., p. 292.

124. LAGRANGE. **Prognosis of chronic glaucoma.** *Ann. d'ocul.*, cxlix., p. 392.

125. VERHOEFF, F. H. **Sclerosis of the ligamentum pectinatum and its relation to glaucoma.** *Jour. A. M. A.*, Sept. 21, 1912.

The theory that glaucoma may be produced by sclerosis of the ligamentum pectinatum, which interferes with the drainage by narrowing the channels leading to Schlemm's canal, is disapproved by VERHOEFF (125, **Sclerosis of the ligamentum pectinatum and its relation to glaucoma**). He examined ten eyes enucleated for glaucoma—three were primary, one hemorrhagic, and six secondary. Some of the cases show the iris pulling away from the ligament, proving that the peripheral synechiæ were once complete. The sclerotic changes in all cases were found chiefly on its surface. Moreover, the fact that the condition appeared in the eyes with secondary glaucoma as well as in primary glaucoma seemed convincing evidence that the sclerosis was not the original cause of the glaucoma. The changes in the ligamentum pectinatum consisted of the formation of vascularized connective tissue, hyaline and elastic tissue during the persistence of the adhesion of the iris root. If the iris is pulled away by cicatricial contraction or by the sphincter, the corneal endothelium may grow over and new tissue form beneath it. ALLING.

FOURRIÈRE (120, **Schioetz's tonometer**) studied systematically the clinical utility of Schioetz's tonometer in the various forms of glaucoma, during the use of meiotics and after operations to reduce the tension. He found considerable fluctuations in the measurements at different times of the day during the prodromal symptoms of acute glaucoma. Otherwise tonometry is a valuable diagnostic aid in acute, subacute, infantile, chronic, and secondary glaucoma. The influence of meiotics on the glaucomatous eye could be followed very accurately, and he emphasizes the point that there are cases in which meiotics do harm. As regards the effect of iridectomy in acute glaucoma, which is still the operation of choice, he distinguishes four groups of cases: In the first the tension remains normal after operation; in the second the tension rises above normal, but is easily regulated by pilocarpine; in the third the tension

increases in spite of the iridectomy and does not respond to meiotics; in the fourth the tension remains normal for a time and then increases again. The effect of this operation is similar in subacute glaucoma, but varies greatly in the secondary form. New attacks of glaucoma may come on in seclusion of the pupil in spite of the presence of a broad coloboma. Lagrange's sclerecto-iridectomy is particularly indicated when a simple iridectomy has proved insufficient, and also in subacute, secondary, and simple glaucoma. He has performed this operation with good results in seven cases of subacute glaucoma, four of chronic, and three of secondary glaucoma due to seclusion of the pupil, but obtained a bad result in a case of secondary glaucoma following a specific iritis and thrombosis of the central vein. The indications for Elliot's operation are the same as for Lagrange's, and the results are almost the same. Sclerotomy is used for the most part only in bad cases, and in these its effect is transient. Cyclodialysis was disastrous in one case. The influence of section of the sympathetic, upon the tension of the eye is very slight. CAUSÉ.

DOR (119, **Glaucomatous vertigo**) observed glaucomatous vertigo in four patients. The vision of one eye was lost, yet he considers that the vertigo forms an indication for an operation on the blind and painless eye. The eye was enucleated in one case, in the others the vertigo was obviated by an operation to reduce the tension. CAUSÉ.

GALEZOWSKI (121, **Preglaucomatous state**) differentiates the preglaucomatous from the prodromal condition, which he holds to be a mild attack of glaucoma. He calls eyes preglaucomatous which exhibit no glaucomatous symptoms, and yet are predisposed to the disease as shown by a marked excavation, refraction that cannot be corrected well, and increasing rigidity of the sclera. The glaucomatous excavation in simple glaucoma is due, he thinks, to the pressure of the extrinsic muscles. The treatment he recommends is the regular use of meiotics together with an accurate correction of the errors of refraction. CAUSÉ.

LAGRANGE (124, **Prognosis of chronic glaucoma**) considers that sudden, slight elevations of tension are particularly apt to occur in neuropathic persons. The prognosis is doubtful when the light sense is faulty, when paracentral scotomata are

present, when a very white discoloration of the papilla corresponds to an impairment of the vision, when the anterior chamber is very shallow, and when there is an early reduction of the range of accommodation. As a rule, there are in these cases trophic disturbances in the degenerated and lacunose optic nerves, in the presence of which surgery is impotent. In his opinion, too many operations have been suggested to replace iridectomy, which is always indicated and should be performed early, except in chronic glaucoma. It is only when the effect of this operation is insufficient that sclerectomy or trephining should be performed. In chronic glaucoma the rational use of meiotics gives better results than operation.

CAUSÉ.

GRUENING (122, **Combined iridectomy and sclerectomy for chronic glaucoma**) has performed the operation introduced by Lagrange twenty-one times and concludes that if it is carefully done under general anesthesia it is preferable to simple iridectomy, because the wound heals more quickly, since it is covered by conjunctiva, and because his results have been better than those obtained from the older operation. He thinks that the incision should not be as long as 12*mm*, as some illustrations have made it. ALLING.

LACOMPTE (123, **Spontaneous intraocular hemorrhage**) observed a spontaneous intraocular hemorrhage which was so severe as to cause rupture of the eyeball, in a woman, 65 years old, with arteriosclerosis. The hemorrhage took place without known cause, and with intense pain in her left eye, which had never before been diseased. The pain subsided in the morning, when she sought medical help. Examination revealed a considerable increase in the volume of the entire eyeball, with total suffusion of the bulbar conjunctiva, permeation of the cornea with blood, and a hyphema filling almost the entire anterior chamber. Just above the limbus of the cornea, at the upper end of its vertical meridian, was a hematoma nearly as large as a nut, in which the lens was later discovered. The sclera had been ruptured at this place by the suddenly increased intraocular pressure so that the eye was soft. By evening of the same day the pain again became unbearable, and the tumor had increased in size a third, so enucleation was performed the next morning. Although the

other eye is not affected in half of the cases heretofore reported, Lacompte considers the prognosis in this case very doubtful because of the arteriosclerosis and the age of the patient.

CAUSÉ.

XXI.—RETINA.

126. BLAKE, E. M. **A case of macular hole due to traumatism.** *Ophthalm. Record*, Dec., 1912.

127. DAVIS, A. E. **Recurrent retinal hemorrhages occurring in the young with report of a case.** *Trans. American Ophthalmological Society*, 1912.

128. ISHIHARA. **Etiology of idiopathic hemeralopia and xerosis conjunctivæ.** *Klin. Monatsbl. f. Augenheilkunde*, 1913, p. 596.

129. KRAUSS, F. **Pseudoglioma in children.** *Ophthalmology*, Apr. 1, 1913.

130. LEPLAT. **Cyst of the ciliary portion of the retina.** *Soc. belge. d'ophtalm.*, April, 1913.

131. OGUCHI. **The effect produced by injections of blood into the vitreous, together with remarks concerning the so-called retinitis proliferans.** *Arch. f. Ophthalm.*, lxxxiv., p. 446.

132. PETER, L. C. **Altitudinal hemianopsia, unilateral and bilateral.** *Ophthalmology*, April, 1913.

The case described by BLAKE (126, **Macular hole due to traumatism**) three weeks after being hit by a baseball showed a sharply defined bright red area in the region of the macula, about one-third the size of the nerve head. The edge was very slightly wavy, and the spot a little depressed below the level of the surrounding retina.

ALLING.

According to DAVIS (127, **Recurrent retinal hemorrhages in the young**) the etiology of these cases is obscure, but tuberculosis, syphilis, and auto-intoxication must be considered. There are repeated hemorrhages, some breaking through into the vitreous. In the later stages retinitis proliferans develops. In his case there was a positive reaction to the tuberculin test.

ALLING.

ISHIHARA (128, **Etiology of idiopathic hemeralopia and xerosis**) found by chemical examination that the content of fat in the blood is more or less diminished in hemeralopia and xerosis, and instituted experiments, controlled by Foerster's photometer, from which he is convinced that both the hemeralopia and the xerosis are caused by the lack of fat in the blood.

This explains at once why these conditions are accustomed to appear in connection with general disturbances of nutrition, when the food is lacking in fat, in liver disease, and in diarrhea. The writer thinks that the formation of the visual purple and of the keratohyalin, the substance of the cornea, is connected in some way with the fat.

KRAUSS (129, **Pseudoglioma in children**) believes that there is a distinct type of disease of the retina occurring in children which produces clinical appearances simulating glioma, yet not like the suppurative chorioiditis that causes what is usually known as pseudoglioma. These cases show that the retinal detachment is formed by an outpouring of a yellowish fluid between the pigment layer and the retina. Hemorrhages and cellular exudates are subretinal and usually confined to the anterior segment of the eyeball. The eye examined by Krauss showed a total detachment of the retina, the subretinal space being filled with an exudate and hemorrhages. The retina itself was degenerated and contained dilated vessels having thickened walls. An inflammatory exudate, partly organized, lay posterior to the lens within the folded retina.

ALLING.

LEPLAT'S (130, **Cyst of the ciliary portion of the retina**) patient had a non-pulsating cyst in the fundus. Twice, with an interval of two months, an incision was made into it through the sclera and fluid evacuated. Then it disappeared, leaving a scar. Its etiology is obscure.

OGUCHI (131, **Injections of blood into the vitreous**) comes to the following conclusions from the results of thirty-five experiments in which he injected blood into the vitreous of rabbits. Blood injected into the vitreous is partly carried away through the central vessel canal, but the greater part breaks down on the spot, is taken up by wandering cells from the ciliary processes and the connective tissue of the papilla and carried to the inner surface of the retina, where it sets up a mechanical irritation that results in a proliferation of glia in the form of little superficial spots. The iron of the hemoglobin exerts a toxic action on the retina, shown by the destruction of the outer layers with an immigration of pigment epithelium. The degeneration thus corresponds to that of retinitis pigmentosa. Retinitis proliferans is only a clinical conception. True retini-

tis proliferans always presupposes hemorrhages, and is produced by a new formation of connective tissue from the perivascular tissue of the papilla. The essential precondition thereto is contact of the vitreous hemorrhage with the surface of the papilla; proliferations of glia play only a subordinate part. With recurrent hemorrhages and in the development of glia proliferation the part taken by the glia may exceptionally be greater. The ophthalmoscopic picture of retinitis proliferans may be produced by the drawing into the vitreous of the papilla and optic nerve, as well as by folds of the retina which are caused by contraction of the newly formed connective tissue, by proliferation of glia and compression of the vitreous. When the retinitis proliferans results from a wound the development of connective tissue from the place of perforation plays an essential part. The necessary precondition for the occurrence of this form of retinitis proliferans is likewise the presence of large hemorrhages in the vitreous and direct contact between them and the place of perforation.

The first case of PETER (132, **Altitudinal hemianopsia**) suddenly became totally blind in the left eye, and later regained the field below the horizontal line, except for a peripheral contraction. The lower half of the optic nerve was gray, and the inferior arteries and veins were atrophic. The lower part of the retina was hazy, and contained atrophic areas and pigment. The lesion was clearly an embolus of the inferior branch of the retinal artery. The second case was one of loss of both upper fields, due to a specific lesion, probably in the inferior part of the chiasm.

ALLING.

XXII.—OPTIC NERVE AND THE VISUAL TRACT.

133. BRUNER, W. E. **Hereditary optic atrophy with X-ray findings.** *Transactions of the American Ophthalmological Society*, 1912.

134. DE SCHWEINITZ, G. E., and HOLLOWAY, T. B. **A clinical communication on certain visual field defects in hypophysis disease, with special reference to scotomas.** *Jour. A. M. A.*, Sept. 21, 1912.

135. DUPUY-DUTEMPS. **Hematoma of the optic nerve sheath in meningeal hemorrhage.** *Annales d'oculistique*, cxlix., p. 450.

136. HANSELL, H. F. **A case of transient blindness complete in one eye, partial in the other; with double optic atrophy.** *Trans. Amer. Ophthal. Society*, 1912.

137. Le Roux. **Unilateral optic atrophy following compression of the thorax.** *Arch. d'ophtalmologie*, xxxiii., p. 231.

138. Mylius. **A case of gumma of the optic papilla.** *Klin. Monatsbl. f. Augenheilkunde*, 1913, p. 648.

139. Sweet, W. M. **A case of primary intradural tumor of the optic nerve.** *Transactions of the American Ophthalmological Society*, 1912.

140. Welton, C. B. **Hemorrhage as the cause of blindness.** *Illinois Medical Journal*, Nov., 1912.

141. Zentmayer, William. **Visual disturbance from distant hemorrhage.** *Jour. A. M. A.*, Sept. 21, 1912.

Bruner (133, **Hereditary optic atrophy**) found by X-ray examination in the case of a man of 36 a decided enlargement of the sphenoidal cells. The patient gradually lost his sight during six months' time, in spite of all treatment, including a decompression operation. There was secondary atrophy, vision counting fingers, and the fields peripheric on the temporal side. An uncle, a brother, a sister, and a nephew, all had suffered from eye diseases showing optic atrophy. Two of these were examined by the X-ray and found to have enlarged sphenoidal cells. Just what these findings indicate in connection with the atrophy he is unwilling to say. The cases were evidently examples of Leber's hereditary atrophy.

Alling.

A girl of 8 came to Hansell (136, **Transient blindness**) with double optic neuritis, edema of the adjoining retina, and muscle paralysis. The right eye was totally blind, fingers could be counted with the left. There was no history of tuberculosis or syphilis, and no other cause could be found. After lumbar puncture and treatment with mercury and iodide the eyes returned to normal. Alling.

Dupuy-Dutemps (135, **Hematoma of the optic nerve sheath**) was able to determine clinically and *post mortem* a hematoma of the optic nerve sheath in a post-traumatic and in a spontaneous meningeal hemorrhage. The blood coming from the subarachnoidal space poured into the intervaginal space, but did not pass the pial sheath, and did not force itself into the trunk of the optic nerve. The sclera proved an impassable barrier, so the blood did not reach the papilla or the retina. It infiltrated the innermost bundles of the dura and the connective tissue surrounding the central vessels so that it enveloped the latter as in a mantle in the orbit. The only

ophthalmoscopic signs were: edema of the papilla with dilatation of the veins and abundant retinal hemorrhages, changes which were the result of the compression of the central vein by the hematoma within the sheath. These ocular signs of a meningeal hemorrhage may be of diagnostic importance as indicating the situation for a decompressive operation.

CAUSÉ.

According to ZENTMAYER (141, **Visual disturbance from distant hemorrhage**), visual disturbances occur more frequently in the female and between the ages of 20 and 50. Usually they appear immediately or within a few hours after the loss of blood. In 88% both eyes were affected. There are found neuritis, papilledema, or optic atrophy, as well as edema of the retina and hemorrhages in the retina. He points out the fact that some underlying disease, with tissue changes, is probably present in the majority of cases. He thinks that retinal ischemia with degeneration of the ganglion cells is the most plausible explanation for those cases showing peripheral field contraction, retrobulbar neuritis for those with central scotoma, central lesions for those with hemianopsia, and simple atrophy and postneuritic atrophy for those with marked superior and inferior contractions of the fields. The injection of blood serum in those cases in which blindness is not immediate seems the rational treatment. He relates two cases and gives those from literature. ALLING.

WELTON (140, **Hemorrhage as the cause of blindness**) relates the case of a man of 58 who vomited a considerable quantity of blood at different times, becoming unconscious after the last attack. It was then found that he had become blind and he remained so for two weeks. Atrophy of the iris, small and sluggish pupils, and atrophy of both nerves were found. The vision was R. $\frac{10}{80}$; L. $\frac{3}{200}$. General examination showed myocarditis and general arteriosclerosis.

ALLING.

The elongated, encapsulated tumor removed by SWEET (139, **Primary intradural tumor of the optic nerve**) involved the optic nerve from nearly its entrance into the eyeball to the apex of the orbit. Its dimensions were 39*mm* by 25*mm*. Its nature could not be definitely decided, but it was thought to be a fibrosarcoma. ALLING.

In MYLIUS (138, **Gumma of the optic papilla**) the diagnosis was rendered certain by a positive Wassermann and the brilliant result secured from inunctions. Perfect recovery with normal vision was an exceptionally good result. A bad prognosis was indicated by the ophthalmoscopic picture, for the transformation of the tumor into cicatricial tissue was to be expected. Therefore the benign course signifies that the tumor originated from the surface.

LE ROUX (137, **Unilateral optic atrophy following compression of the thorax**) had the opportunity to observe a unilateral optic atrophy after a severe compression of the thorax in a miner 28 years old. The patient was brought in unconscious, and with a diffuse ecchymotic infiltration of the face and neck, immediately after the accident. The eyes were examined on the sixth day. There were enormous subconjunctival ecchymoses, but the left eye was normal internally, while the vision of the right was almost lost, a condition that was ascribed to a marked edema of the papilla with a small hemorrhage extending into the retina. The vision improved slowly, yet remained bad with an atrophic discoloration of the papilla. According to the generally accepted theory, the cause of the ecchymosis of the face and neck is the venous blood is made to flow backward into the vena cava superior by the sudden intense compression of the thorax and the efforts to ward it off, and that it is then forced into the jugular because of the resistance afforded by the valves in the veins of the upper extremities. The rarity of retinal hemorrhages as compared to the frequency of the ecchymoses of the face and neck after compressions of the thorax is explained by the fact that the intraocular tension is higher than the blood pressure in the retinal vessels. Le Roux thinks that the visual disturbance which was so great at first was caused by a commotio retinæ, which may have been the consequence of an injury of the retinal elements by the sudden increase of the blood pressure to so great an extent.

CAUSÉ.

Although a bitemporal hemianopsia is frequently found in diseases of the hypophysis, DE SCHWEINITZ and HOLLOWAY (134, **Visual field defects in hypophysis disease**) point out that lateral homonymous and nasal hemianopsia may also occur. As the pressure is sometimes from vascular and cystic growths,

variations in the fields are constantly to be found in the same subject. The scotomas are small and paracentral, later expanding into a complete hemianopsia. Quadrant defects up and out may be found, and occasionally a scotoma has been noted in the temporal field at a considerable time before the whole field is obliterated. They believe that the small percentage of field defects found by former observers in acromegaly and hypophyseal disease is due to the fact that examinations may have been made when the scotomas were not present and that sufficiently careful search was not made.

ALLING.

XXIII.—ACCIDENTS, INJURIES, FOREIGN BODIES, PARASITES.

142. ALLPORT, F. **A case of non-magnetic steel in the vitreous.** *Ophthalmic Record*, June, 1913.

143. CLAIBORNE, J. H. **A piece of glass in the crystalline lens, with description of the eye three years and a half after the accident.** *Annals of Ophthalmology*, April, 1913.

144. CRIGLER, L. W. **Burn of the eyeball due to caustic contents of golf-ball.** *Jour. A. M. A.*, April 26, 1913.

145. DE SCHWEINITZ, G. E. **Fracture of the skull with hemorrhage into the optic nerve sheath and retina. Microscopic examination of the eyeballs.** *Transactions of the American Ophthalmological Society*, 1912.

146. KNAPP, PAUL. **Bilateral disease of the macula after a short circuit.** *Zeitschrift f. Augenheilkunde*, xxix., p. 440.

147. KRIDER, E. E. **Report of a case of steel passing through eyeball into the orbit.** *Ophthalmic Record*, Dec., 1912.

148. LEWIS, G. G. **Two interesting cases of foreign body in the eye.** *Annals of Ophthalmology*, Oct., 1912.

149. OLLENDORF. **Kuhnt's conjunctival plastic in perforating wounds.** *Zeitschrift f. Augenheilkunde*, xxix., p. 557.

150. ROLLET. **Extraction of non-magnetic intraocular foreign bodies.** *Annales d'oculistique*, cxlix., p. 396.

151. ROY, J. M. **Revolver bullet in the chiasm. Consecutive binocular blindness.** *Ophthalmology*, Oct., 1912.

152. SHAHAN, W. E. **Ophthalmia electrica; report of a case.** *Journal of Missouri State Medical Association*, May, 1913.

153. WOOD, CASEY A. **Burns of the eyeball from the contents of so-called "water core" golf-balls.** *Ophthalmic Record*, Oct., 1912.

ALLPORT (142, **Non-magnetic steel in the vitreous**) found a piece of steel in the vitreous a few *mm* from the wound of entrance, not far from the sclerocorneal junction. No reaction

was obtained from either the large or the small magnet, and the X-ray, through some fault in technique, showed no foreign body. Panophthalmitis having set in, the eye was removed and the piece of steel was discovered where originally located. It proved to be iron with from 16% to 19% manganese, which accounts for its non-magnetic quality.

ALLING.

ROLLET (150, **Extraction of non-magnetic intraocular foreign bodies**) first determined the exact position of the foreign bodies by the X-ray. His first case was one of a piece of bronze behind the ciliary body, which was removed with a curette after iridectomy had been performed and the clear lens extracted. In the other two cases he trephined the sclera and removed the foreign bodies through the opening. In one of these, the foreign body was a piece of copper, and the eye was saved. CAUSÉ.

A youth came to CLAIBORNE (143, **Glass in the lens**) with a wound in the eye received through the explosion of a bottle. A small spicule of glass, about 3 or 4*mm* in length, entered through the ciliary region just back of the zonula, and the X-ray showed it to lie behind the equator of the lens. The eye became quiet and retained a vision of $\frac{20}{40}$. After the lapse of a year, a few opacities could be seen in the lens on the side of the foreign body. ALLING.

So-called "water core" golf-balls contain some highly irritating solution which, as in the case of WOOD'S (153, **Burns of the eye from the contents of so-called "water core" golf-balls**), may squirt into the eye and produce burns which are more or less serious. ALLING.

The danger of opening the so-called "water core" golf-balls is being shown by the cases of burn which have been reported of late. CRIGLER (144, **Burn of eyeball by caustic contents of golf-ball**) adds another, in which chemical analysis disclosed the contents of a ball of similar make to the one which caused the accident to be a mixture of barium sulphate, soap, and free alkali (sodium hydroxide 2.4%). The eye was nearly lost, retaining only vision of counting fingers at one foot, the blindness being due to a dense opacity of the cornea.

ALLING.

LEWIS (148, **Two interesting cases of foreign body in the**

eye) describes a case in which a bird-shot entered through the eye and became encysted within the orbit. Three weeks later the vitreous was filled with opacities and the vision had fallen to $\frac{2}{200}$. About six months after the injury, the eye was found to be entirely cleared and to have normal vision. There was an opaque spot just below the macula, showing where the shot had passed through the eyeball. The other case was that of a boy whose eyes were injured by an exploding cap. Traumatic cataracts were formed which became absorbed after needling. Dark spots were observed in the iris angle of each eye and were thought to be pieces of metal. There was no reaction, the vision was normal, and no attempt was made to remove the foreign bodies. ALLING.

KRIDER'S (147, **Steel passing through the eyeball**) case shows the importance of exact localization of foreign bodies by the X-ray. Although the eye was not inflamed and had a fair degree of vision, it was hastily, and apparently unnecessarily, enucleated. The steel was found in the orbit.

ALLING.

OLLENDORF (149, **Kuhnt's conjunctival plastic in perforating wounds**) reports his results from this procedure in eight simple and twenty complicated perforating wounds of the eye. In only two of the latter the eye could not be saved. General anesthesia is needed when there is a prolapse of vitreous from the wound, but local anesthesia is sufficient in other cases.

SHAHAN'S (152, **Ophthalmia electrica**) patient was standing five feet from a circuit breaker which closed with a flash. Twelve hours later he had considerable pain. When examined, the cornea was slightly roughened and the vision was $\frac{20}{30}$. The vision returned to normal in three days under mild local applications. GROUT.

KNAPP (146, **Bilateral disease of the macula after a short circuit**) describes a case of blinding by the flash of a short circuit, in which the picture of the flame was, as it were, photographed upon the retina in the form of a chorioretinitic spot by a sort of instantaneous photography. The light strength at the moment must have been 150,000 candle power. Knapp thinks that the luminous, rather than the ultraviolet, rays were the cause of the injury.

In the case recorded by ROY (151, **Revolver bullet in the**

chiasm) the bullet crossed the left orbital cavity, injuring the vaginal sheath, and came to rest in the chiasm, producing hemianopsia in the left eye, and optic-nerve atrophy with total blindness in the right. The location of the bullet was confirmed by the X-ray. ALLING.

DE SCHWEINITZ (145, **Fracture of the skull with hemorrhage into the optic-nerve sheath and retina**) found a hematoma of the optic-nerve sheath in the case of a man who died as the result of fracture of the skull, and in whose eyes retinal hemorrhages had been found. The blood in the sheath may have been derived from vessels injured by the fracture extending through the optic foramen, as is probably the case as a rule, but it may also have entered the sheath through a perfectly intact canal, in the same manner as fluid may be forced artificially by being injected into the arachnoidal space. Retinal hemorrhages are not pathognomonic of hematoma of the sheath in brain traumatism, but are suggestive. The condition may be present sometimes without retinal hemorrhages. ALLING.

BOOK REVIEWS.

I. Guide to the Microscopic Examination of the Eye. By Professor R. GREEFF. Translated from the 3rd German Edition by HUGH WALKER. Glasgow, pp. 86. London: The Ophthalmoscope Press, Thayer St., W., 1913. Price 7/6 net.

Professor Greeff's little guide has appeared in a number of editions in German, and has been favorably known to laboratory workers for some years. In the last German edition, the author has been fortunate enough to have as collaborators Stock and Wintersteiner, who have done such excellent work in the pathology of the eye. It is this edition which Mr. Walker has now translated into English, and English-speaking students of ophthalmology are surely very much indebted to him. It is not only the only book in English on this subject, but the work of the translator is so well done that the original text has lost nothing. It is to be hoped that the English translation of this excellent guide will serve as an incentive to the more systematic microscopic examination of specimens in the American eye hospitals.

A. K.

II.—Précis d' Ophtalmologie. Digest of Ophthalmology. By V. MORAX. Paris, 2nd edition, pp. 768. Masson & Co., Publishers. Paris, 1913. Price 14 francs.

This excellent short textbook, which was favorably commented upon in these ARCHIVES, Vol. XXXVI., 1907, has now appeared in a new edition. This has given the author an opportunity to rearrange the book and to add some new matter, in which he was assisted by Drs. Landriea and Polack. The additions consist in the description of sporotrichosis, tonometry, operations for glaucoma, the diploscope, and a chapter on treatment, giving the more frequent formulæ.

The book is thus thoroughly brought up to date and this, added to the many excellent features which remain from the first edition, makes it one of the best and most scientific of the smaller textbooks of ophthalmology. A. K.

III.—Trachoma and its Complications in Egypt. By A. F. MacCallan. Published at the University Press, Cambridge, 1913; pp. 74. Price 7/6 net.

The extensive work which is being done by the British Government in Egypt in combating trachoma is marvellous. Under the administration of Dr. MacCallan, there are now fourteen hospitals in the various provinces of Egypt, not to speak of the travelling hospitals. In 1912, over 28,000 patients were treated and more than 21,000 operations performed. The enormous amount of good which is being done to relieve the suffering and disability is not generally known. In this book an attempt is made to give a description of trachoma as found in Egypt, and the methods of treatment employed.

In addition to the interest which this description must arouse, the book contains much of practical value to all those working in larger cities or communities where trachoma is met with. Trachoma in Egypt is peculiar, because it is nearly always complicated with acute conjunctivitis of some form or other. The follicles in Egyptians usually begin on the tarsus, not in the fornix as in Europeans. The author expresses no views on the active agent, and considers the question as at present highly indeterminate. The treatment, according to the stages, consists in silver nitrate, copper sulphate, the mechanical ruptures of the follicles with a sharp spoon and Graddy's forceps, the Heisrath, or the Kuhnt operation. The sequelæ are treated by the operations usually practiced. Dacryocystitis is common and is treated by syringing or excision. Trachoma without secretion is not a bar to the performance of other operations on the eye.

In a final chapter on statistics, the author states that about 95% of the population are afflicted with trachoma. A short bibliography is appended. Dr. MacCallan is to be congratulated upon the wonderful work he is accomplishing in Egypt, in which he shows not only unusual administrative talent, but a scientific spirit. A. K.

CORRESPONDENCE.

EYE INFIRMARY, GLASGOW,
14th January, 1914.

SIR:

As a man who has been one of your constant readers for a considerable number of years, may I encroach on your space to the extent of saying that the operation of trephining the sclera for glaucoma, described in the excellent textbook of Tōrōk and Grout, is not Major Elliot's, but is mine. The operation there described, as also described in Swanzy and Werner, is in every detail, even to the clearing of the sclera, the operation which I performed as early as the 14th of January, 1909, without any difference whatsoever. Why Sir Henry Swanzy should have written Elliot's operation and then described mine, I do not know, but, subsequently to his having done so, in a letter addressed to myself, he expressed very sincere regret on what had been an inadvertence on his part. As already said, the operation described in Swanzy's textbook was done by me in every detail early in 1909. The cases are recorded in journals but were never published, the reason being that dealing with so important a condition as glaucoma no one has a right to disturb established practice unless on the sure foundation of extensive clinical observation. Simple scleral trephining was used by me very early in 1909, and still is used by me in what I regard as suitable cases. I have made no communication of any extent on the subject.

Von Graefe's operation did much good service, and any attempt to alter a well-established and beneficial practice should only be done on very extensive clinical observation. A man may do an operation often in private but should refrain from publishing it till it is well established to himself. As a rule, there are few things more objectionable than the preliminary note.

I hope before long to make a communication to the Royal Society of Medicine on trephine operations. Simple scleral trephining at the margin of the cornea, after the reflection of the conjunctiva over the cornea, was the operation performed by me in January, 1909. How it got abroad I do not know, but early in April I received a very courteous invitation to show the operation at Oxford during the following summer. I suppose some of the visitors to my clinic must have carried information, but unquestionably it had become common knowledge both in Edinburgh and London by the beginning of April. The gentleman who wrote to me from London in the month of April said that he had heard of the operation from Edinburgh sources. Up till that time I had not said a word about it, nor have I said much yet. During that spring and early summer, Major Elliot was in this country. He certainly was in it when the operation was well known both in London and Edinburgh.

I enclose a copy of a certificate which bears out these facts. My first operation must have been done eight or nine months before Major Elliot's.

As to the results of it and as to my present opinion of it, I meantime say nothing, as I hope, perhaps in the spring if room can be found for me, to say something to the Royal Society of Medicine.

Believe me to be,
Yours sincerely,
A. FREELAND FERGUS.

Dr. ARNOLD KNAPP,
10 East 54th Street,
New York City, U. S. A.

I certify that I have been associated with Dr. Fergus's clinic for a period of nearly twenty years, and was present when he did his early operations of trephining for glaucoma. The first of these which he did at the hospital took place on the 14th of January, 1909.

The steps of the operation were as follows:

1st. Dissection of a conjunctival flap by means of scissors and forceps; the flap being dissected up as close to the corneal margin as possible and laid back over the cornea.

2d. The episcleral tissue was thoroughly cleared away.

3d. A Bowman's trephine was laid on the clear surface, with the cutting orifice close up against the reflected flap of conjunctiva—that is, as close to the corneal margin as it could be held. The trephine being held vertically and rotated, a disk of sclera was removed.

4th. The trephine hole left was covered with the replaced conjunctival flap and a stitch inserted to retain the flap in position.

At later operations he modified his first by occasionally passing in an iris repositor through the trephine opening so as to clear more extensively the filtration angle. But even yet Dr. Fergus frequently operates by simple trephining alone. The introduction or non-introduction of the repositor entirely depends upon the condition of the corneo-iridic angle.

(Signed) LEWIS MCMILLAN, M.D.

GLASGOW,
15th January, 1914.

MISCELLANEOUS NOTICES.

XII INTERNATIONAL CONGRESS OF OPHTHALMOLOGY.

ST. PETERSBURG, AUGUST 10–AUGUST 15, 1914.

OFFICE: OPHTHALMIC HOSPITAL, MOCHOWAJA, 38

St. Petersburg, January, 1914.

Third Circular.

The Central Bureau announces that the Ministry of the Interior has authorized **free entrance** and an **unlimited stay in Russia to all Members of the Congress without exception.**

The Ministry requests Members of the Congress to pay attention to the following:

1. **On presenting the passport for visa** by the Russian Consul residing in the country, owners of the passport are requested to notify, that the reason of their journey is to take part in the Congress.

2. In case the passport has not been viséd by the Russian Consul, **it is sufficient to present** at the frontier, as a proof of bona fides, **the card of admission,** which will save the holders from any difficulties at the frontier and grant them an unlimited stay in Russia.

In the rules for the Congress, § 2, the 1st of February, 1914, has been fixed as **final term for sending off the reports.** Thanks to manifold requests the term has **been prolonged till the 1st of April, 1914.**

Further the Central Bureau announces that the **group of the East-Chinese Railways,** as well as the Russian Government

Railways, have consented to grant a reduction in all the three classes between the 28/15 of May and the 14/1 of October, 1914.

The principal Lines of the **East Chinese** Railway are:

Wladiwostok—Charbin
Charbin—Mandschurei
Charbin—Tschan-Tschun.

The Company of the "**Voluntary Fleet**" allows a **free passage** in both directions on all its steamers, from Wladiwostok to Odessa from the 14/1 of June till 28/15 September, 1914, though meals, etc., taken on board will be charged extra.

The cabins on the steamers of this Line are equal to the second-class cabins of the modern mail-steamers.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

ANNUAL CONGRESS, 1914.

President: F. RICHARDSON CROSS, F.R.C.S.

The next ANNUAL CONGRESS of the SOCIETY will be held on **Thursday, Friday,** and **Saturday,** the **23d, 24th,** and **25th** of **April, 1914.**

The Meetings will be held at the Rooms of the ROYAL SOCIETY OF MEDICINE, 1 WIMPOLE STREET, LONDON, W., and the arrangements will be as follows:

Thursday, April 23d—

10 a.m. to 1 p.m.	Papers.
4 p.m.	Business Meeting. 4.30 p.m. Tea.
5 p.m.	Bowman Lecture, by Professor UHTHOFF, Breslau, on "Experiences and Considerations on the Importance of Ophthalmology in Brain Surgery."
7.30 p.m.	Dinner.

Friday, April 24th—

10 a.m. to 1 p.m. .	Discussion on "Post-operative Complications of Cataract Extraction." To be opened by Mr. E. TREACHER COLLINS and Lieut.-Col. H. HERBERT.
3. p.m. . .	Clinical Meeting at the Central London Ophthalmic Hospital, Judd Street, W.C.

Saturday, April 25th—

10 a.m. to 1 p.m. .	Papers.

Greeff, Über das Vorkommen von geschlitzten Pupillen beim Menschen.

Verlag von J.F. Bergmann, Wiesbaden. Königl. Universitätsdruckerei H. Stürtz A.G. Würzburg.